

FIG. 1

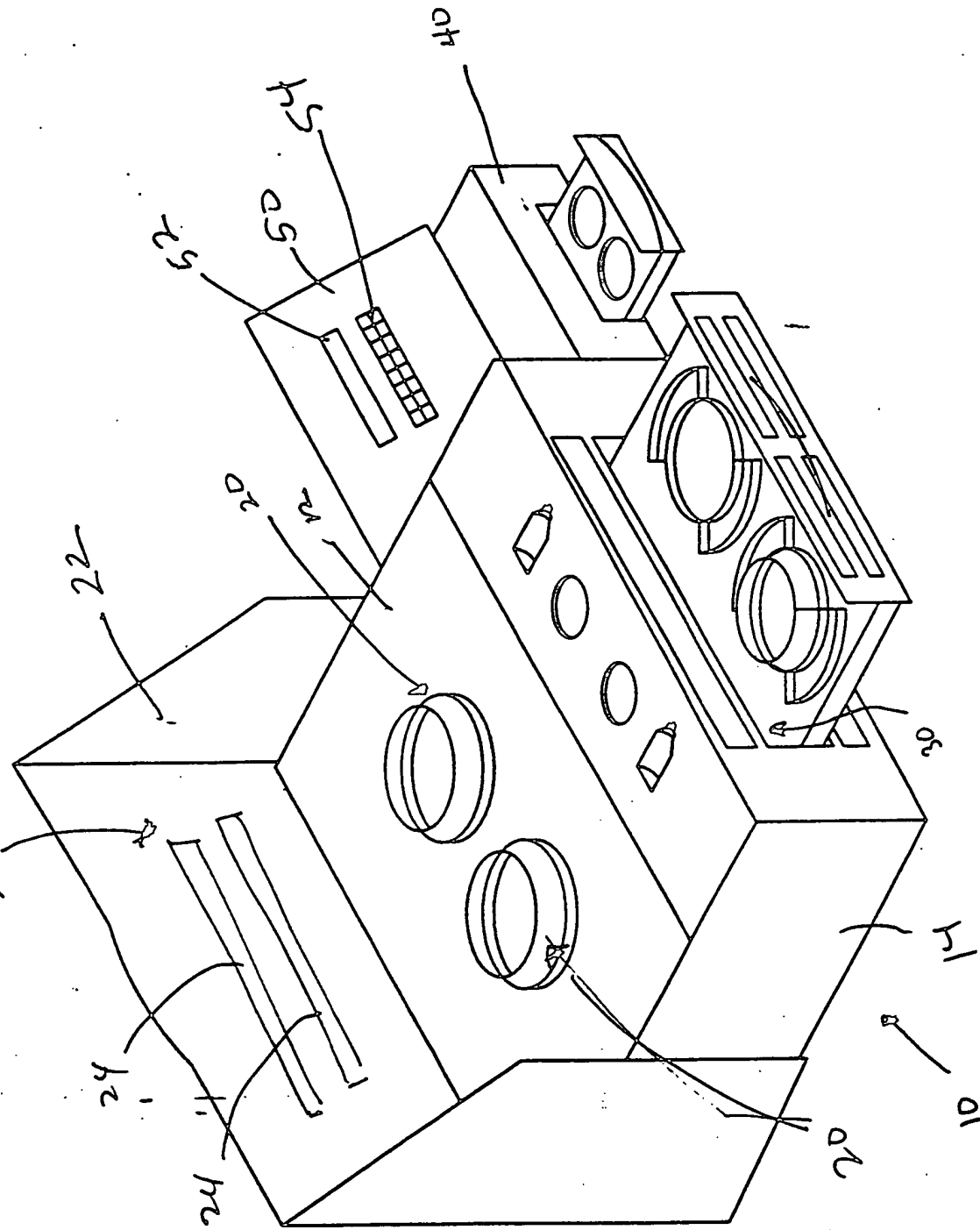


FIG. 1

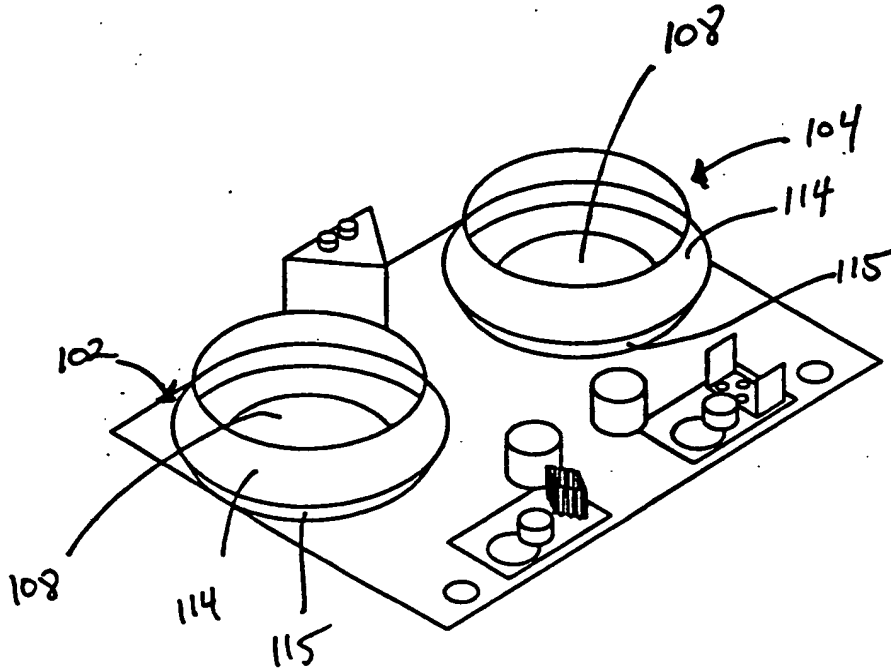


FIG. 2

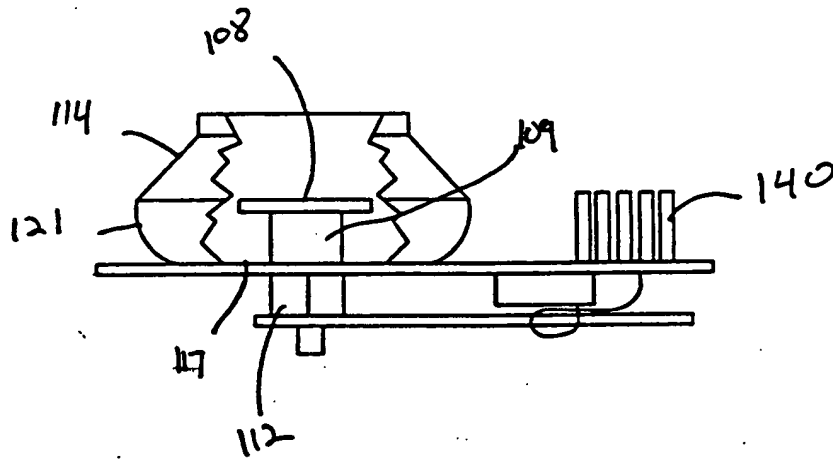


FIG. 3

FIG. 4

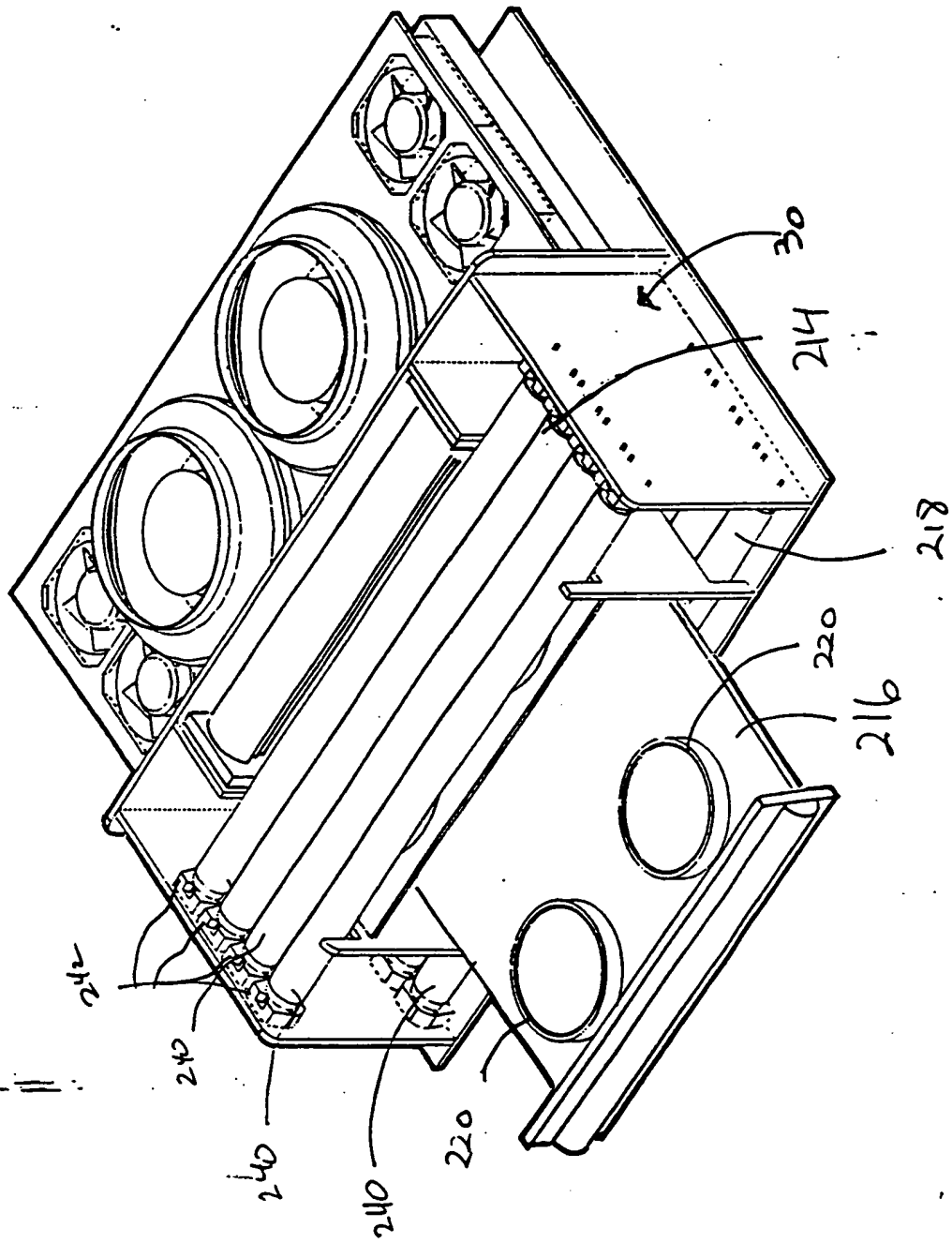


FIG. 4

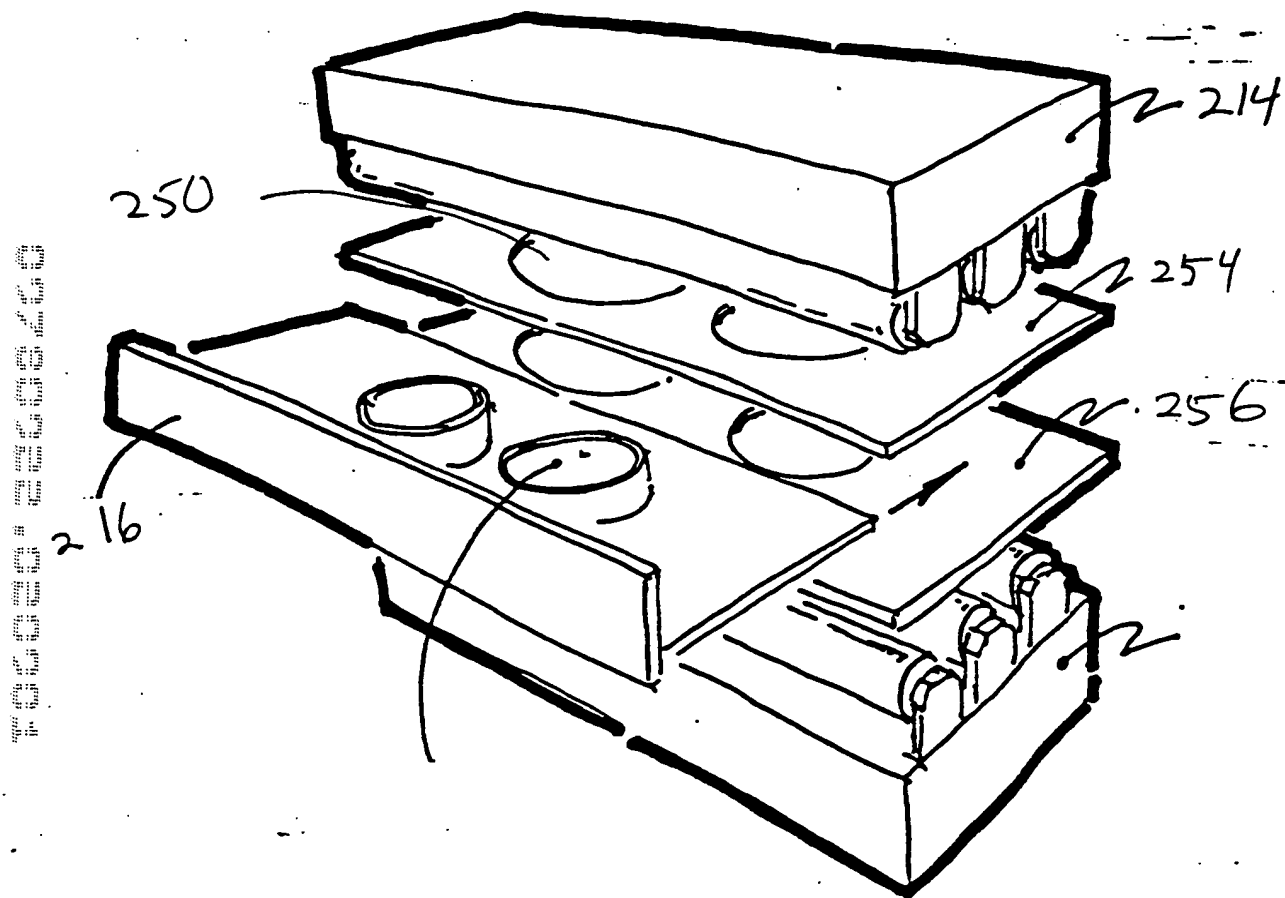


FIG. 5

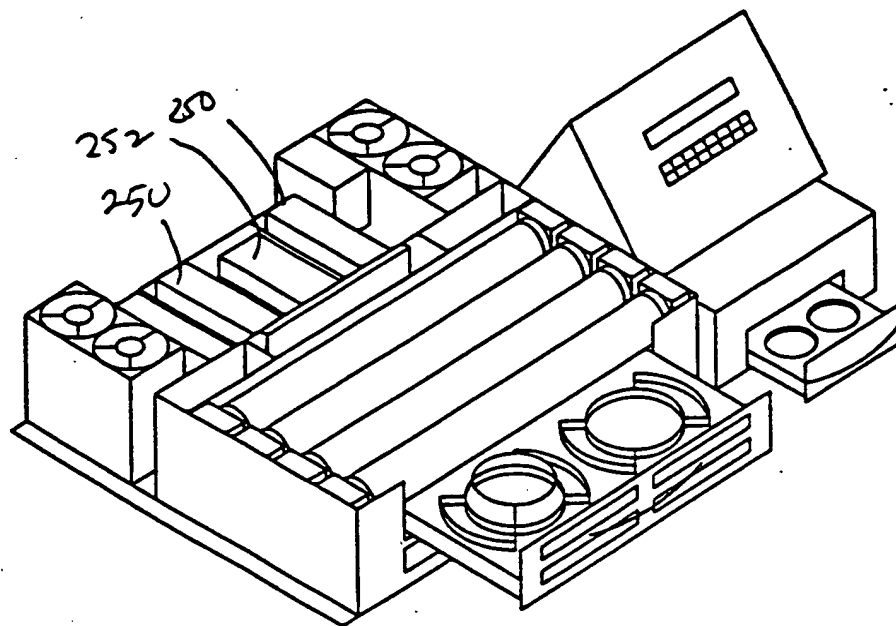
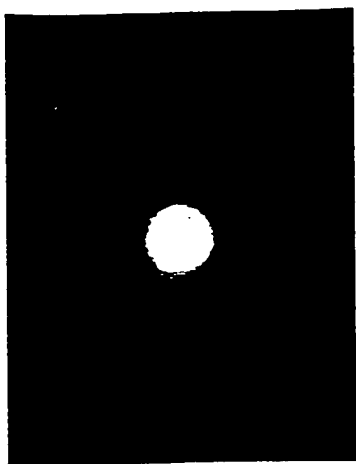
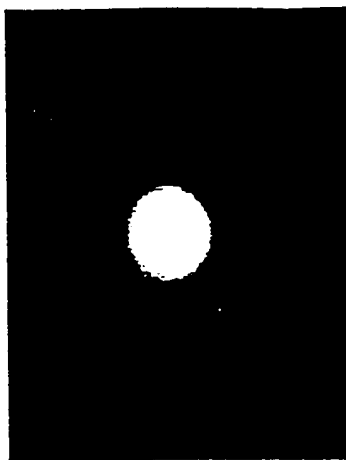


FIG. 6



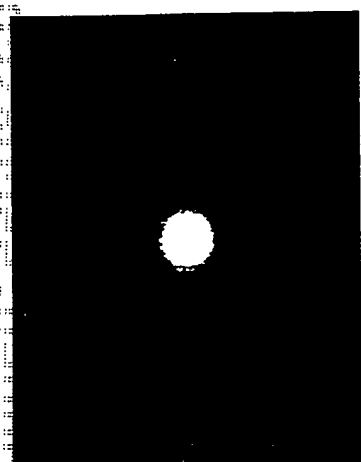
A



B



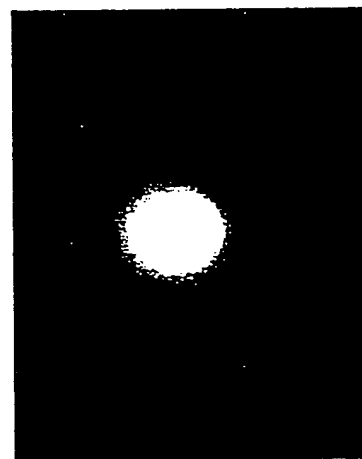
C



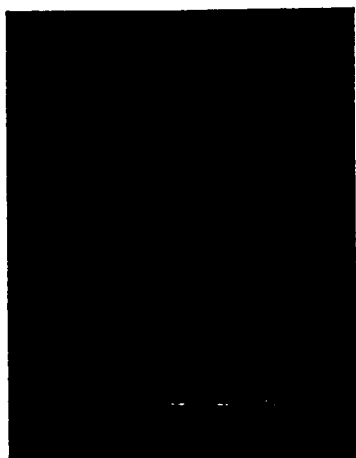
D



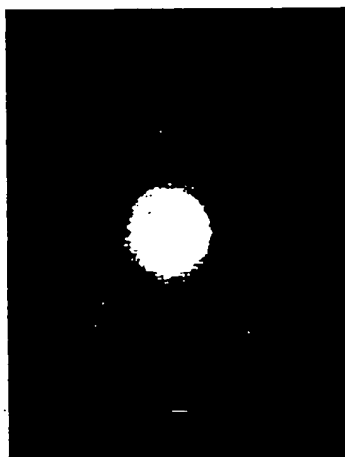
E



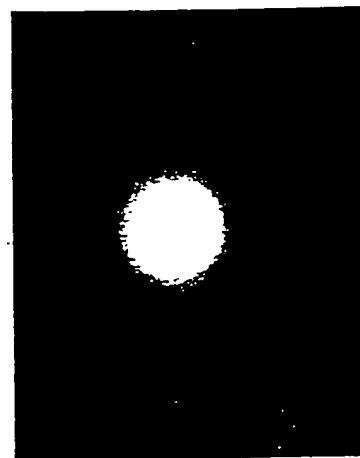
F



G



H



I

FIG. 7

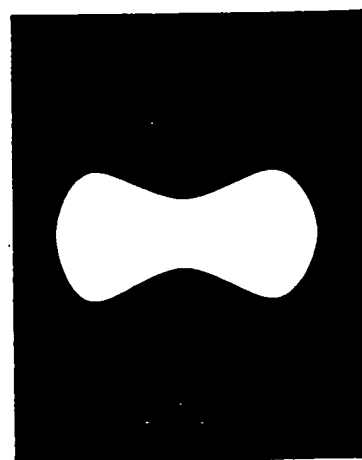
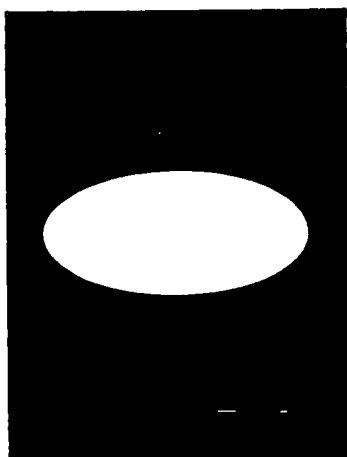
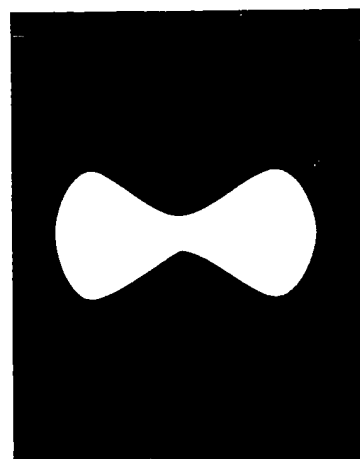
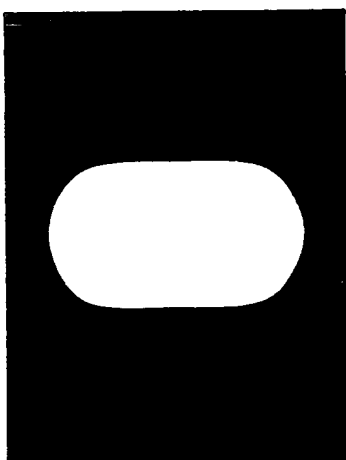
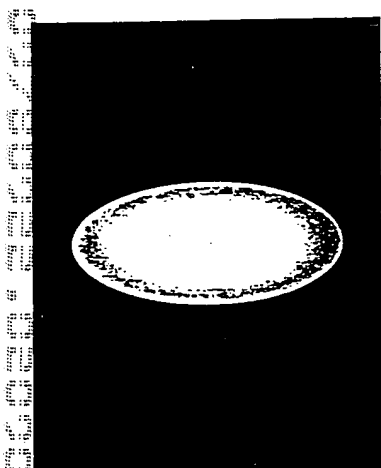
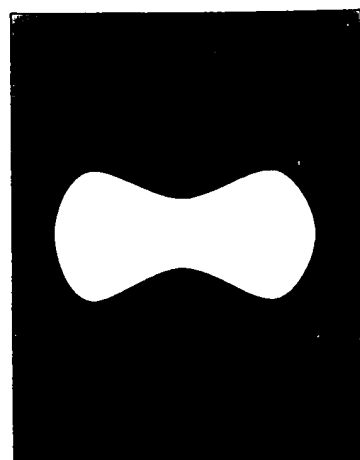
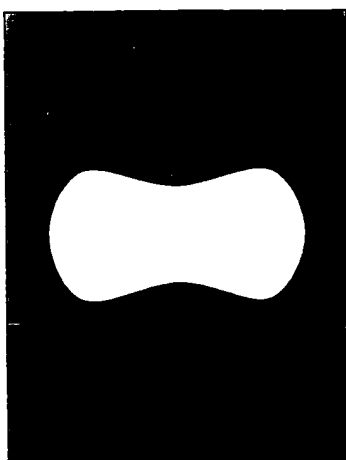
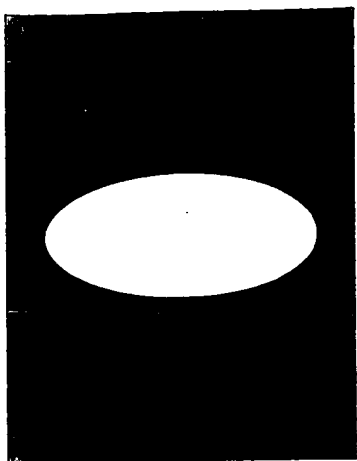
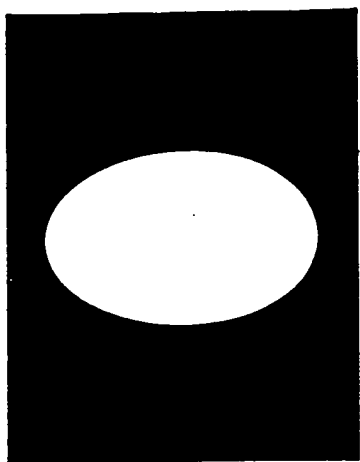


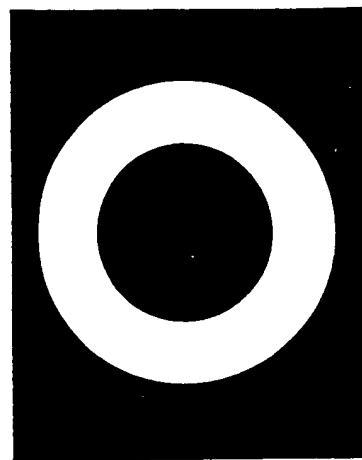
FIG. 8



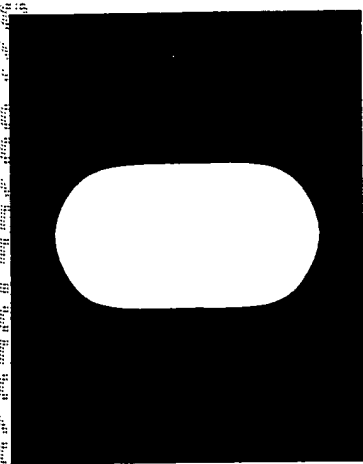
A



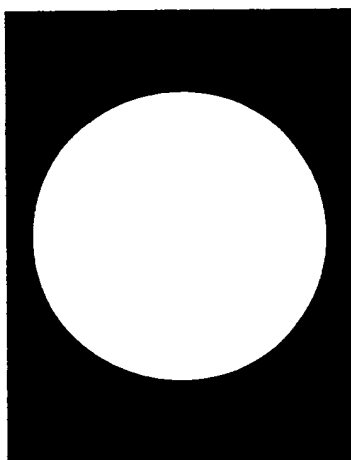
B



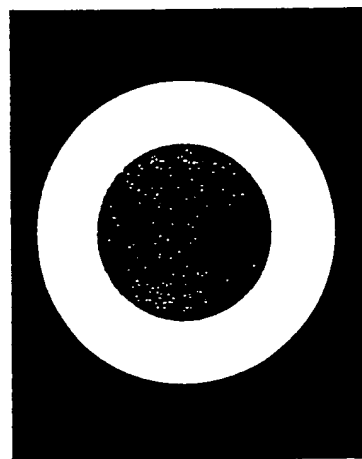
C



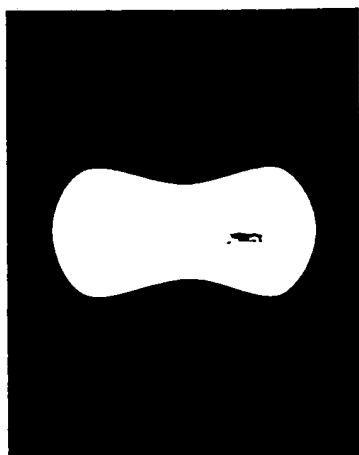
D



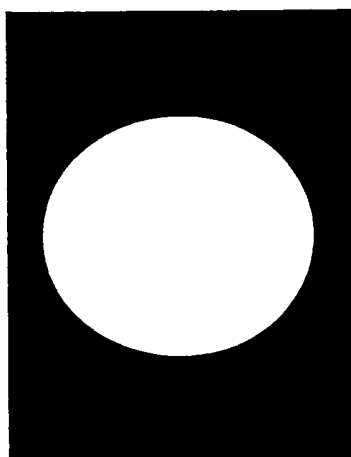
E



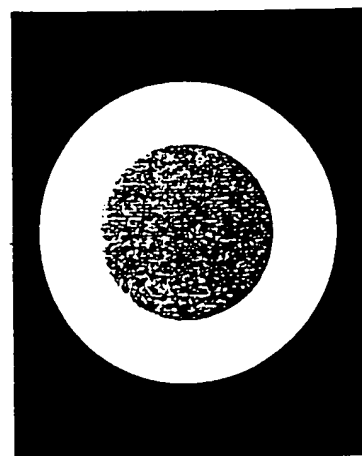
F



G

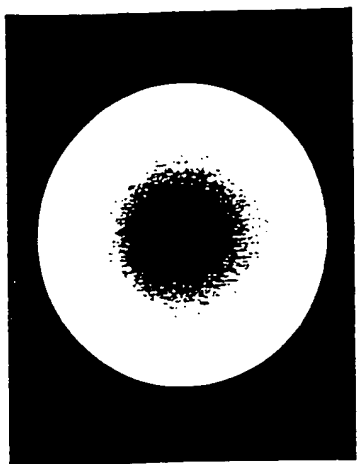


H

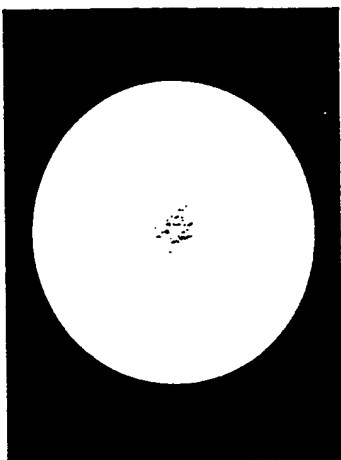


I

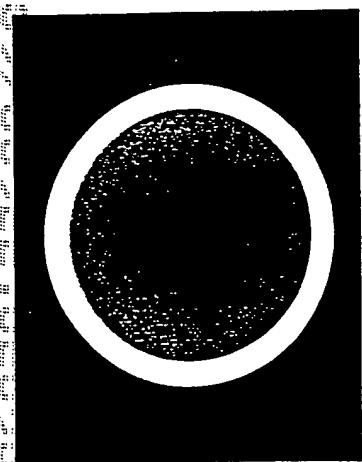
FIG. 9



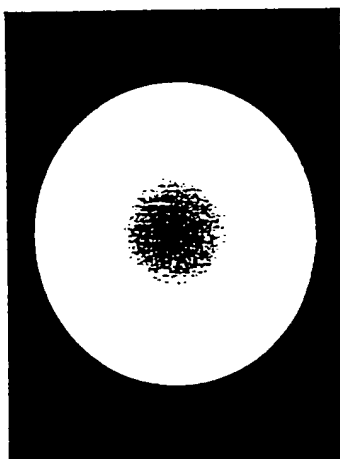
A



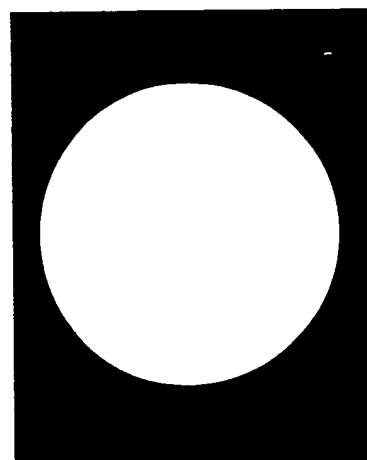
B



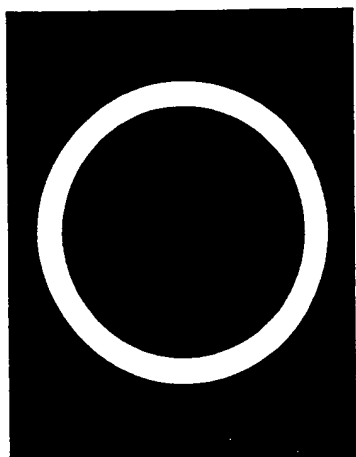
D



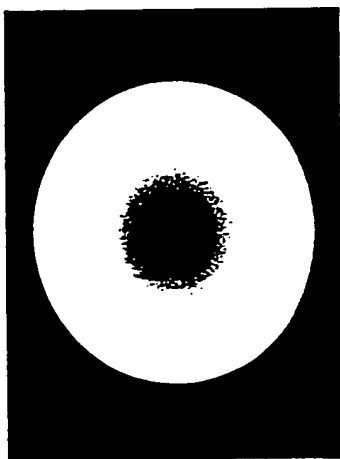
E



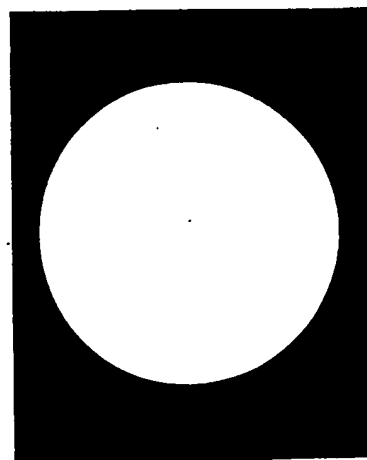
F



G



H



I

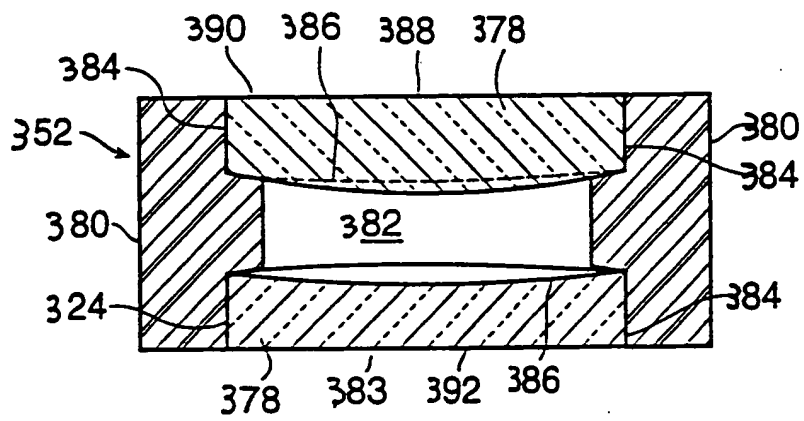


FIG. 11

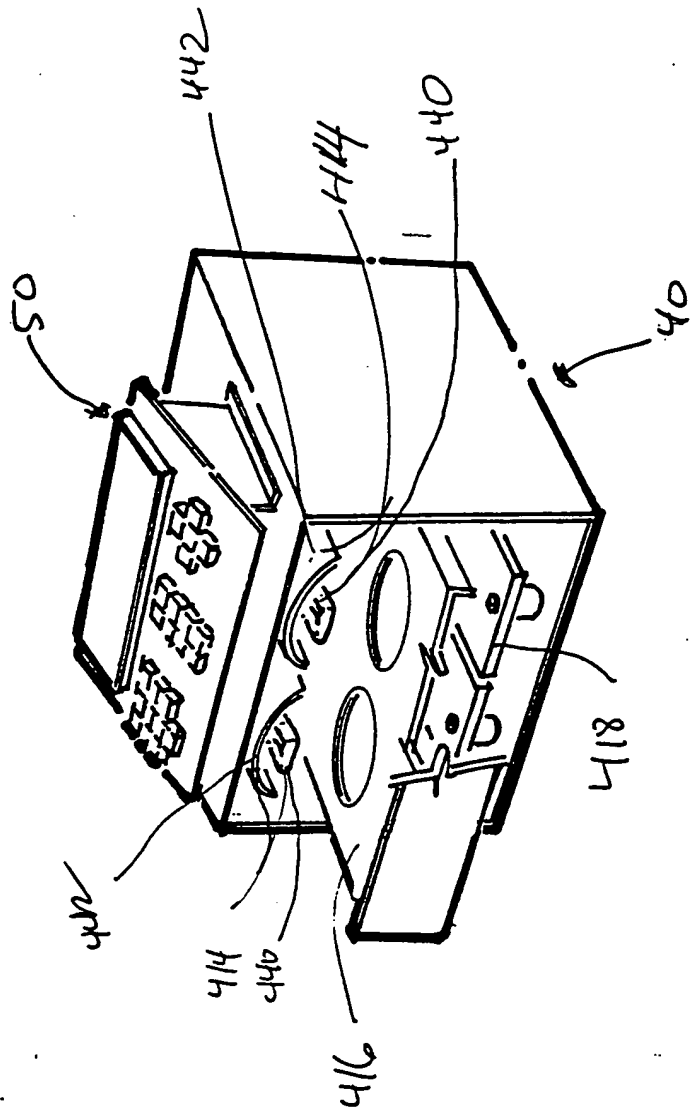


FIG. 12

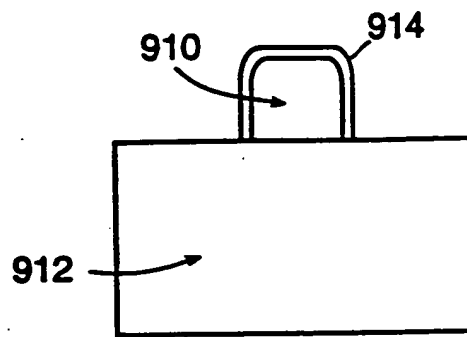


FIG. 13

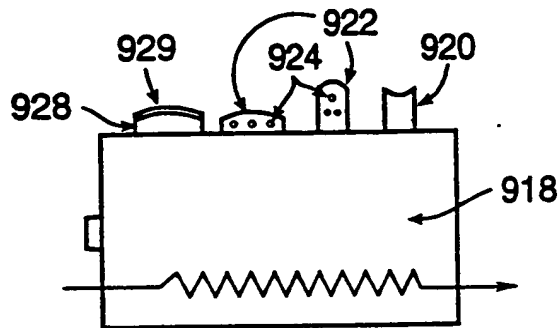


FIG. 14

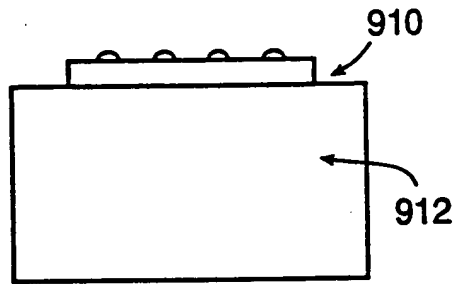


FIG. 15

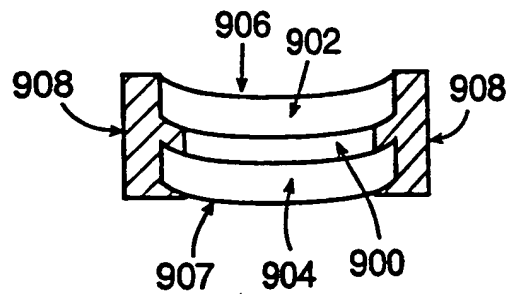
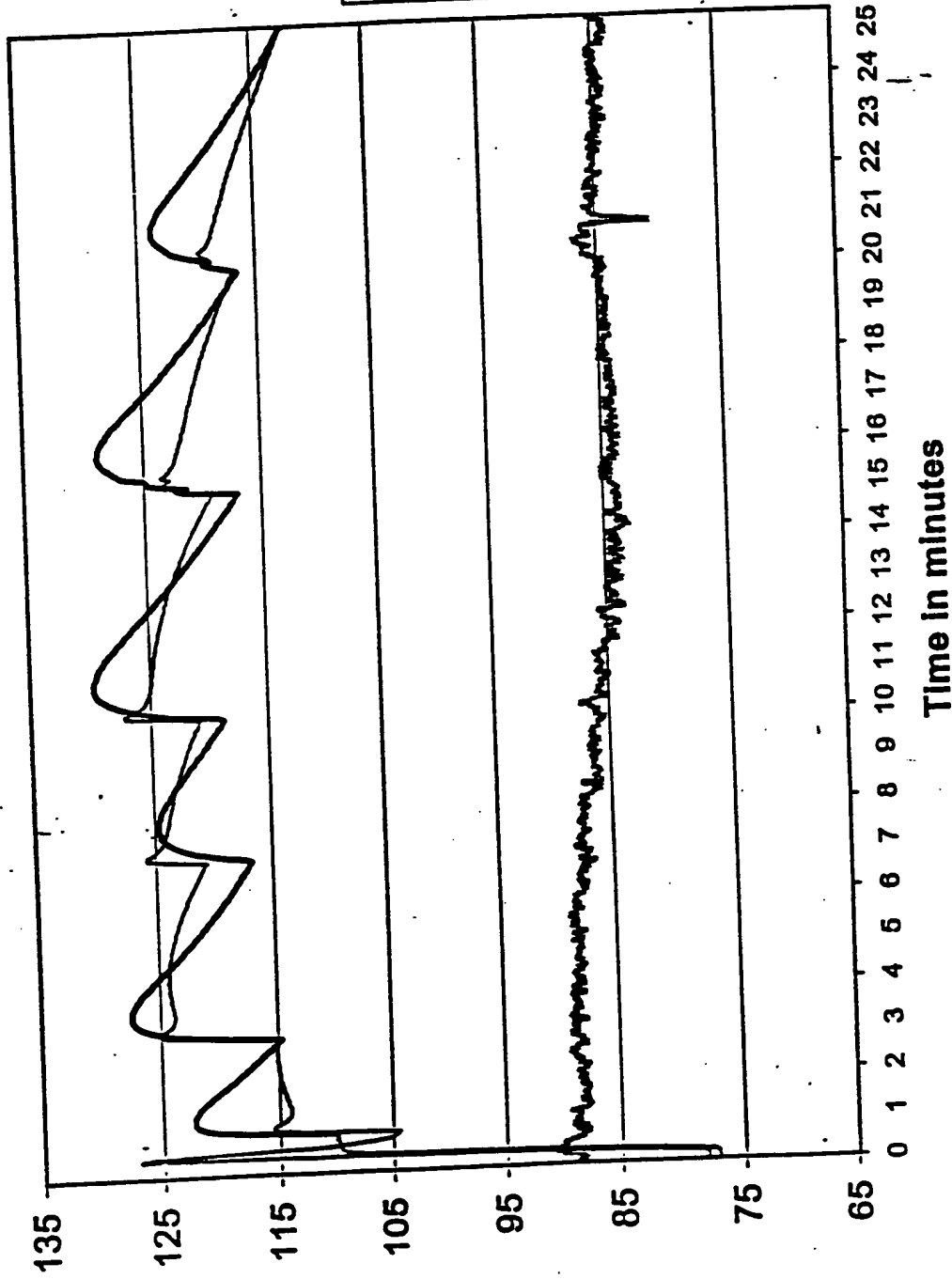


FIG. 16

Fig. 17



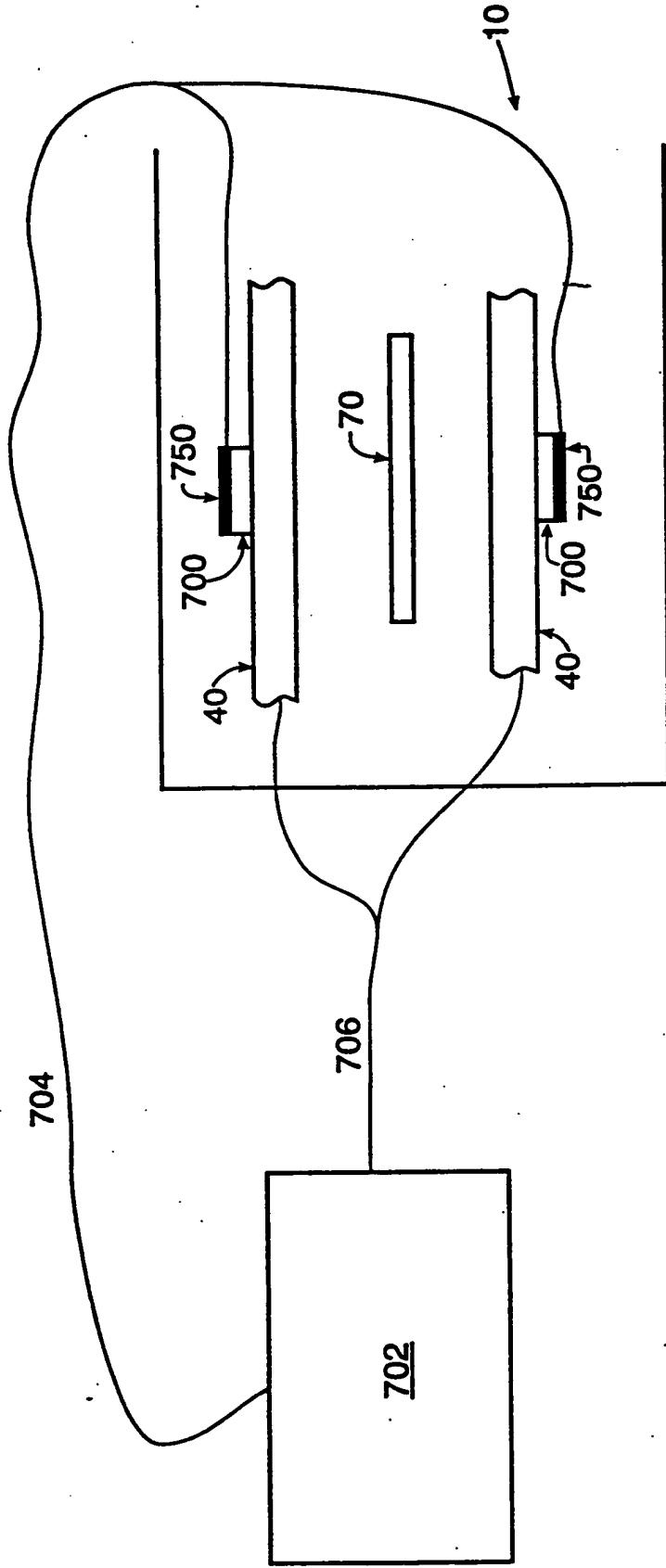


FIG. 18

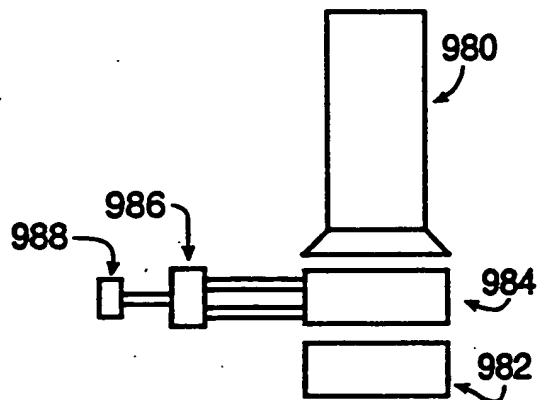


FIG. 19

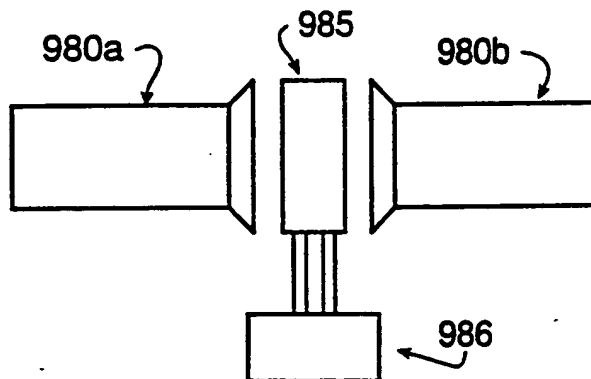


FIG. 20

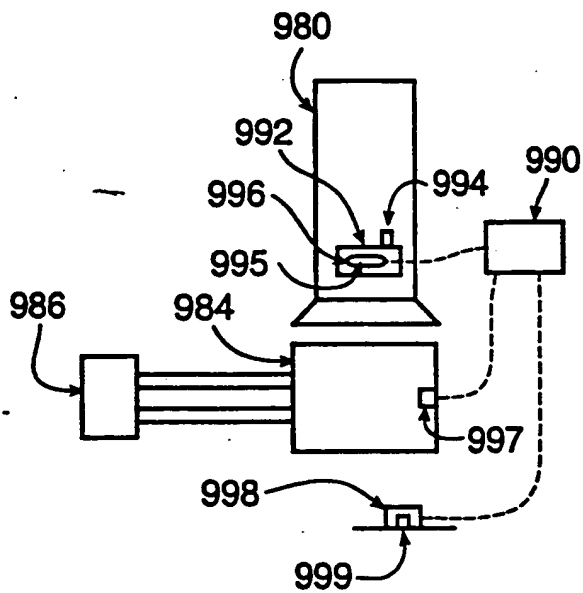


FIG. 21

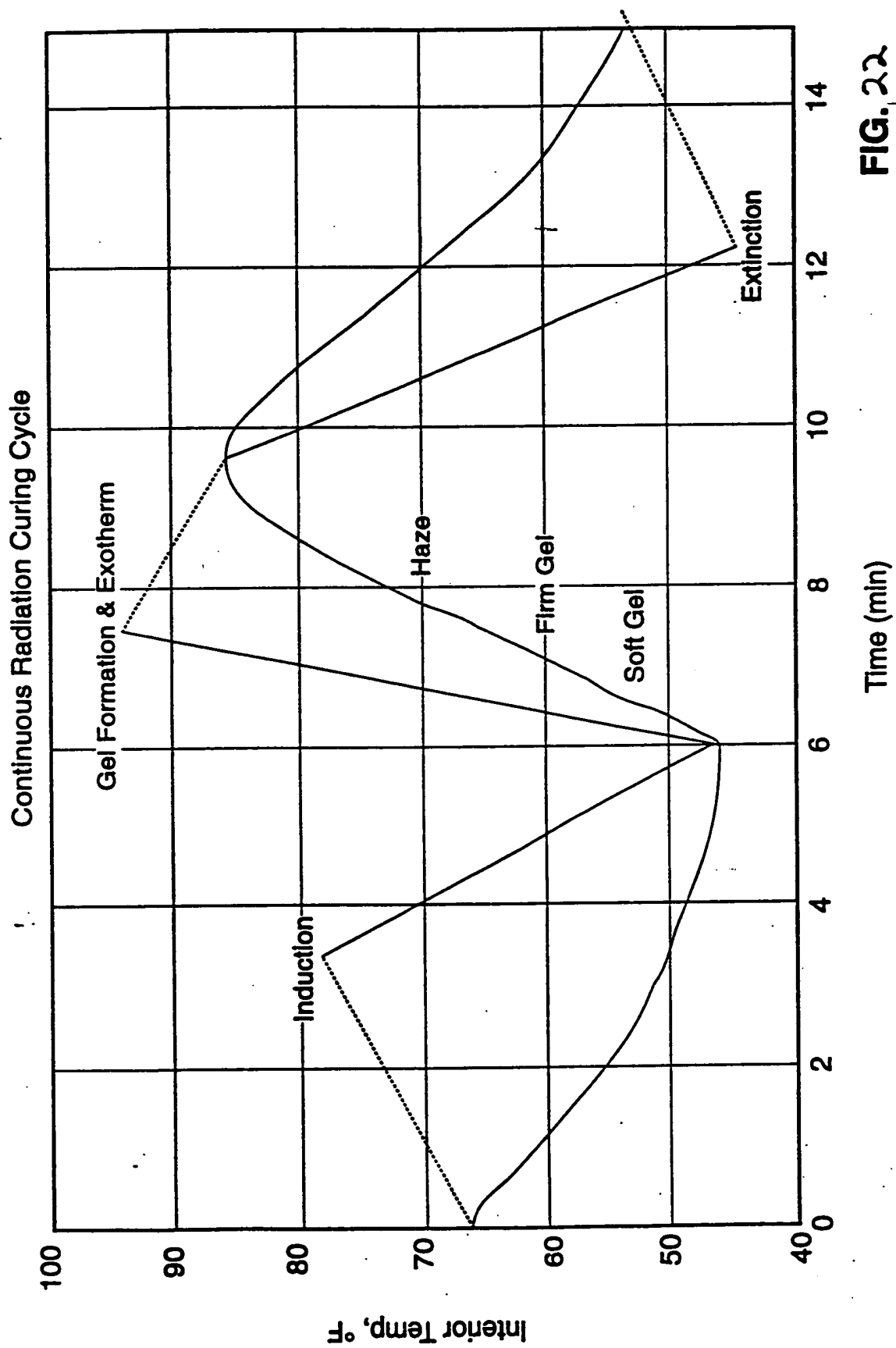


FIG. 22

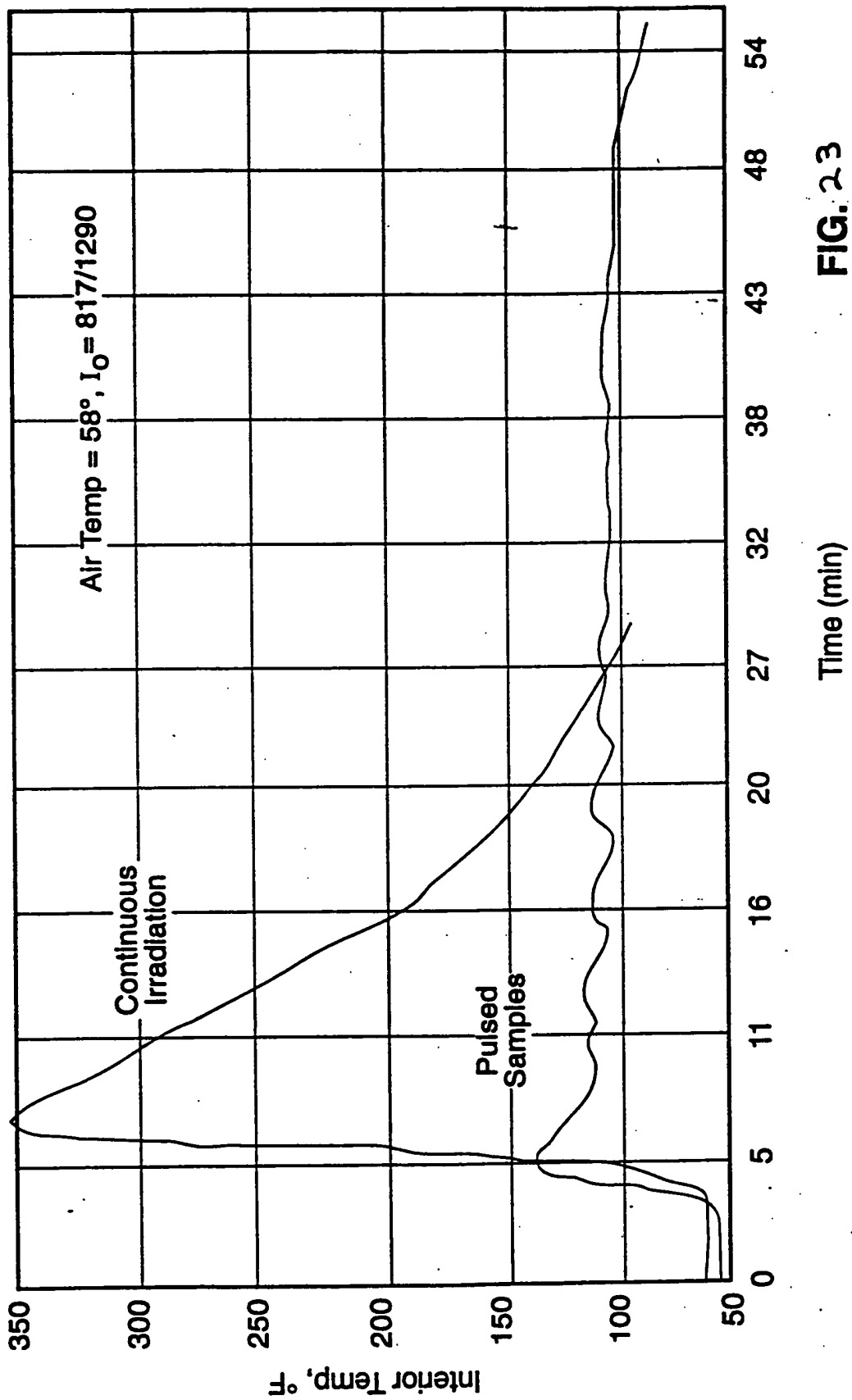


FIG. 23

Interaction of Pulsed Method Variables

The effect that this variable will tend to have:

MASS OF SAMPLE

**On this cycle
variable in:**

OPTIMAL
INITIAL
EXPOSURE
TIME

As sample mass increases, initial exposure time may be increased. The mass of the sample interacts with light intensity to determine a preferred initial exposure time.	As light intensity increases, initial exposure time may tend to decrease. The light intensity level may be controlled for a fixed curing cycle and initial exposure time. It is believed, however, that changes in light intensities may have little impact above a certain light "saturation" point for the sample.	The rate of cooling tends to have a small impact upon the preferred initial exposure period.	Differences in inhibitor & initiator levels between batches of otherwise identical monomers may significantly affect induction periods. Various radiation curable compounds may also vary widely in their preferred initial exposure times due to inherent differences in their reactivity.
Increased sample mass may require increased total cycle time to dissipate the additional heat generated.	Increased light intensity may cause a decrease in the initial exposure period. It is believed, however that changes in light intensities may have little impact above a certain light "saturation" point for the sample.	Increased rates of heat removal may allow for a reduction in the time between pulses and thus total cycle time.	A significant effect that various monomers may have upon total cycle time will come from their different preferred initial exposure times.
Increased sample mass may require longer periods of cooling between pulses of light. More heat tends to be generated from each pulse for larger samples, thus requiring longer time periods to remove heat.	For a given light intensity level, the duration of the pulses may be adjusted to create the desired amount of reaction. The timing between the pulses may also be so adjusted.	Increased rates of heat removal tend to allow for a reduction in the time between pulses.	The duration of the pulses may be adjusted to create the desired amount of reaction and heat generation for the for the particular lens forming material being cured. Adjusting the cooling period between pulses may also be beneficial.

TOTAL
CYCLE
TIME

TIMING BETWEEN PULSES

Interaction of Pulsed Method Variables (continued)

The effect that this variable will tend to have:

On this cycle
variable in:

TOTAL
EXPOSURE
TIME

MASS OF SAMPLE	LIGHT INTENSITY	RATE OF COOLING	IDENTITY OF MONOMER
Increased sample mass tends to require both increased initial exposure time and a greater number of pulse/cooling cycles.	Increased light intensity will tend to result in decreased total exposure time and decreased light intensity will tend to require increased exposure time. It is believed, however, that changes in light intensities may have little impact above a certain light "saturation" point for the sample.	There is only a small relationship between the total dosage of light a particular mass sample requires to polymerize and the rate at which it is being cooled.	A significant effect that monomer identity may have on total cycle time may be contributed by differences in the preferred initial exposure period. Various lens forming materials may also require longer/shorter duration pulses depending upon their reactivity.
The length of the pulses during each phase of the curing cycle may be adjusted for different mass samples. The time between pulses may be increased/decreased according to mass.	The duration of the pulses may be varied in inverse proportion with the light intensity selected. It is believed, however that changes in light intensities may have little impact above a certain light "saturation" point for the sample.	A pulse will tend to generate a certain amount of heat to be dissipated. Since the pulse duration tends to be small relative to the time between pulses when the heat is being removed, changes in the rate of heat removal should not significantly affect the ideal pulse duration.	Various lens forming materials require different pulse duration depending upon their reactivity. For a selected material, slight differences in initiator & inhibitor levels will not tend to affect pulse duration.

DURATION
OF
PULSES

FIG. 24
(continued)

FIG. 25

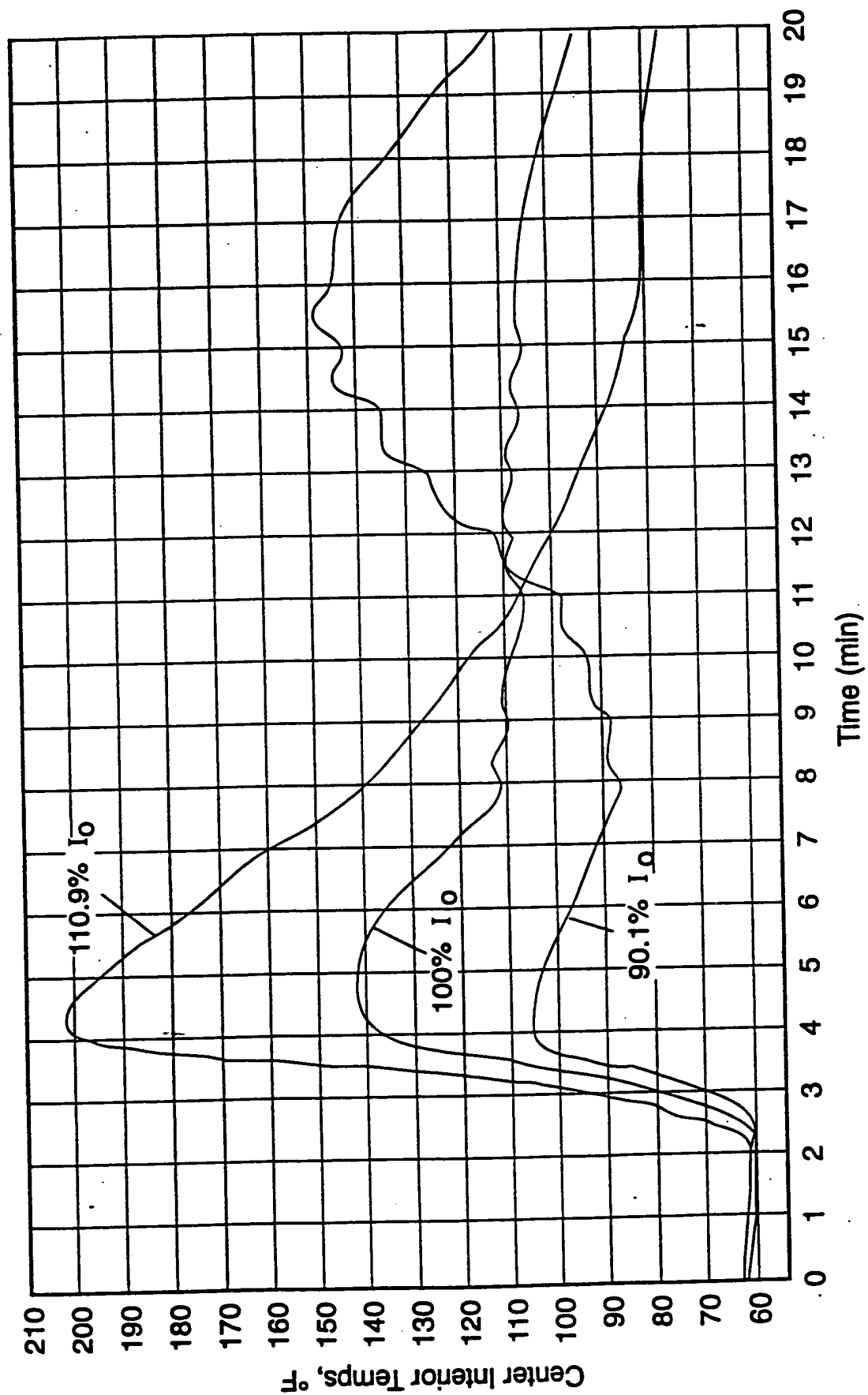


FIG. 26

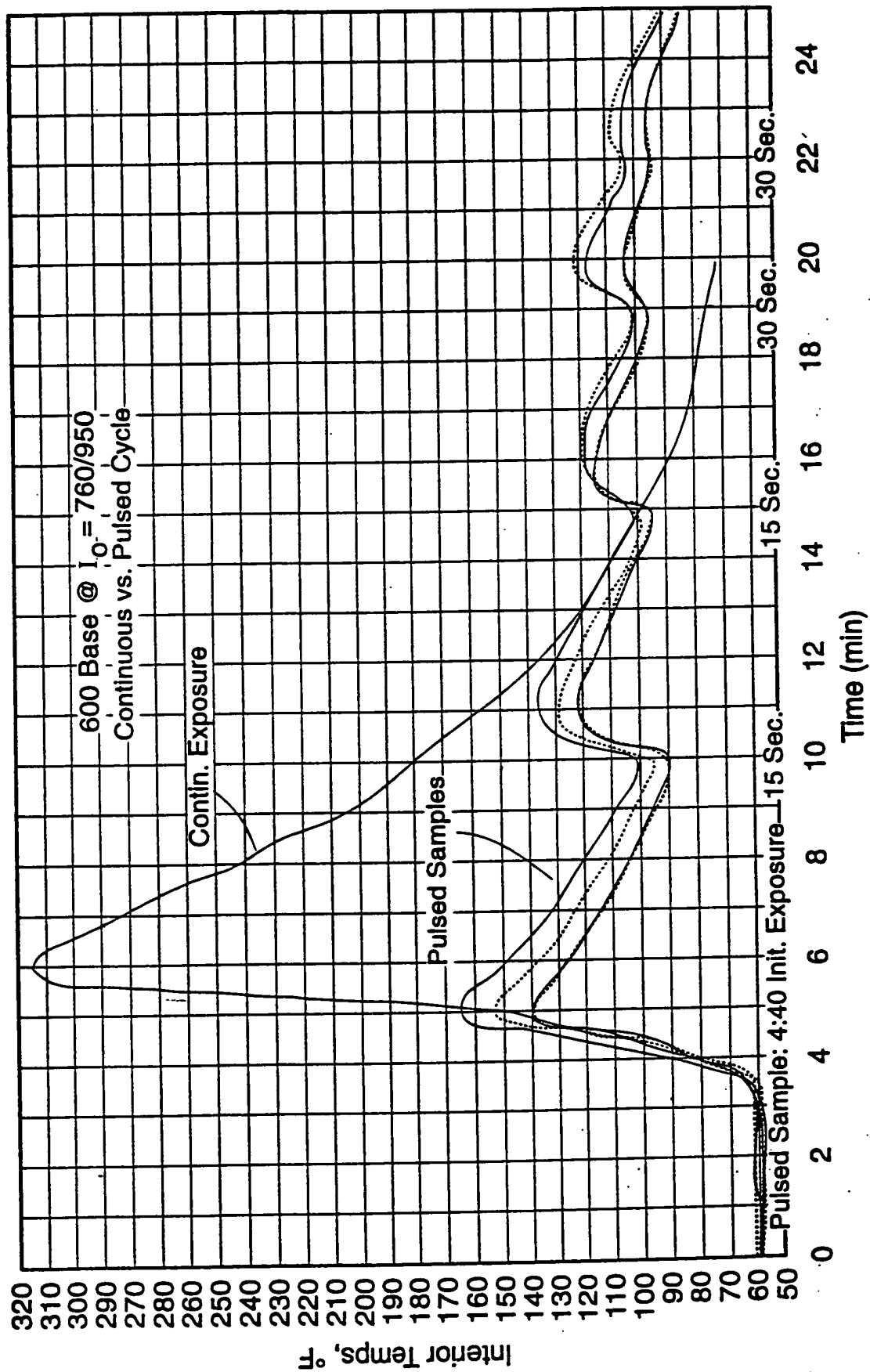


FIG. 27

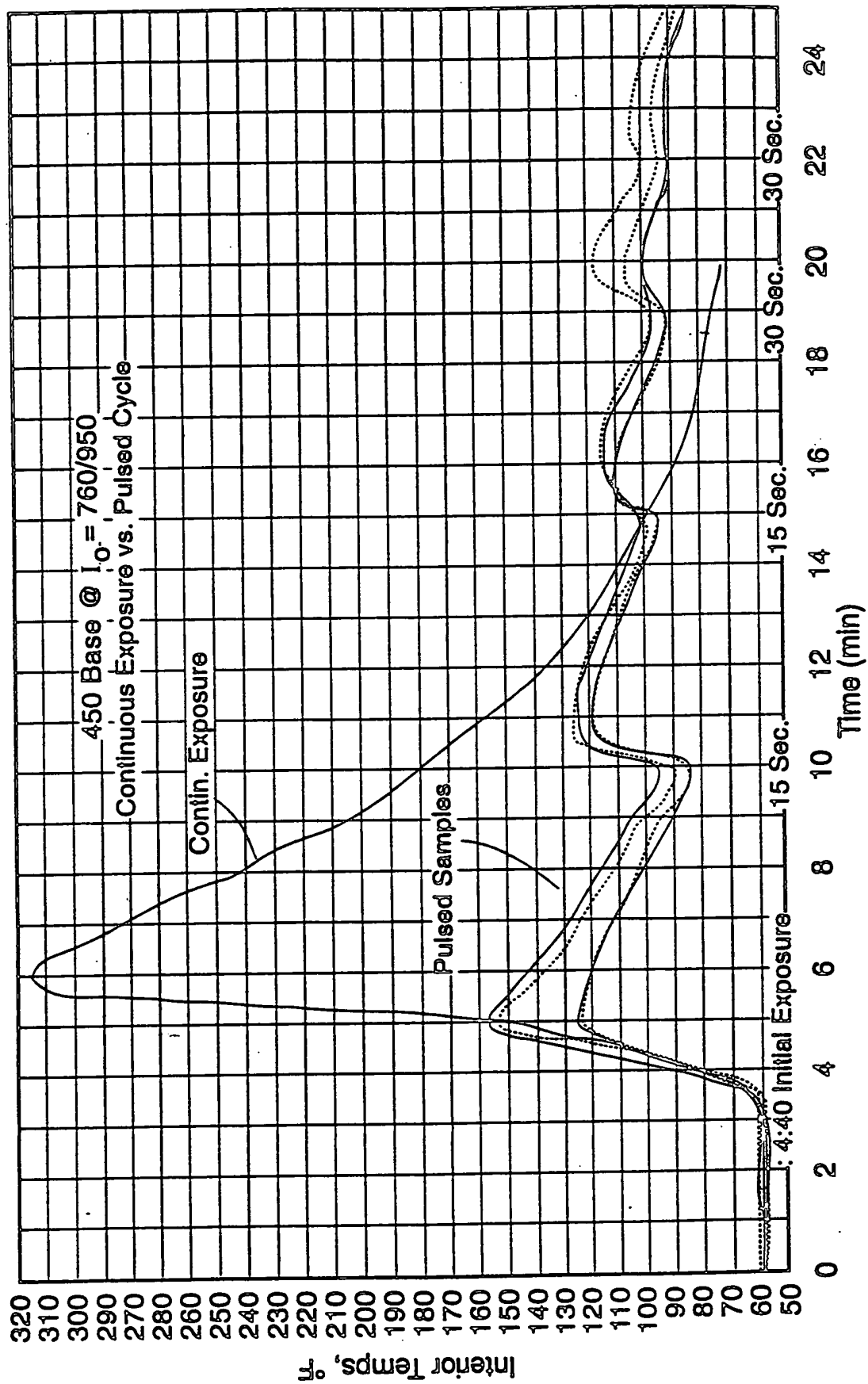
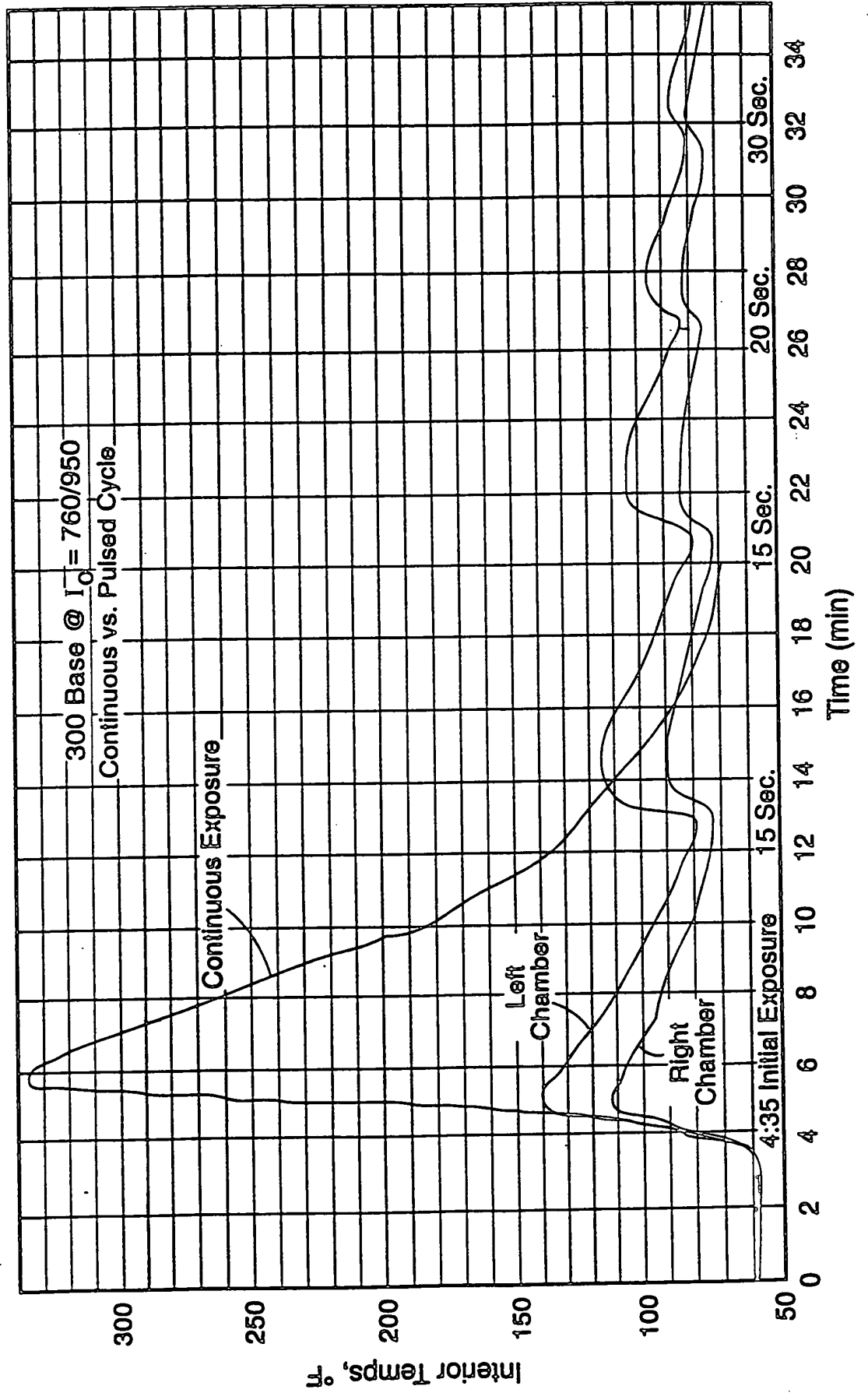


FIG. 28



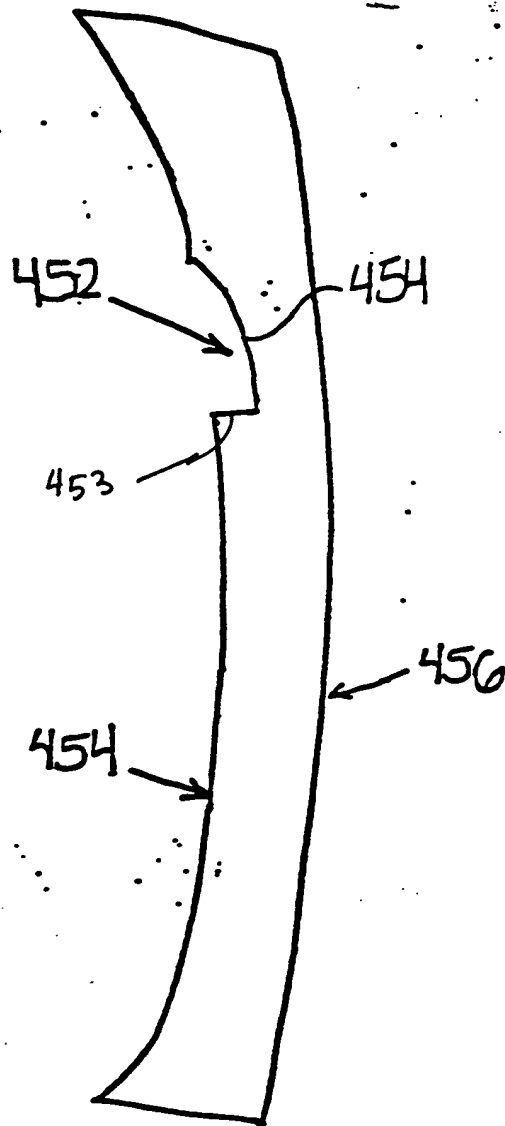


FIG. 29

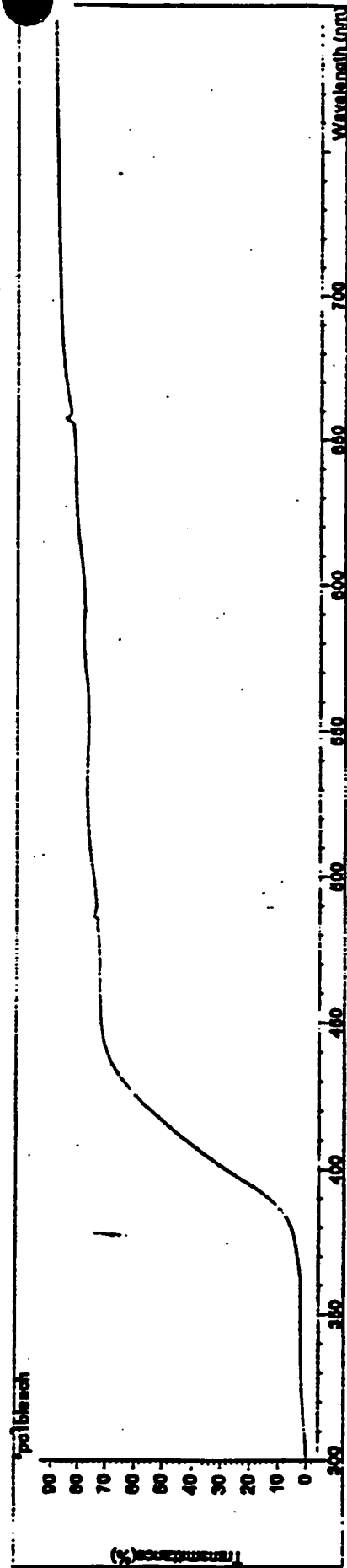


FIG. 30

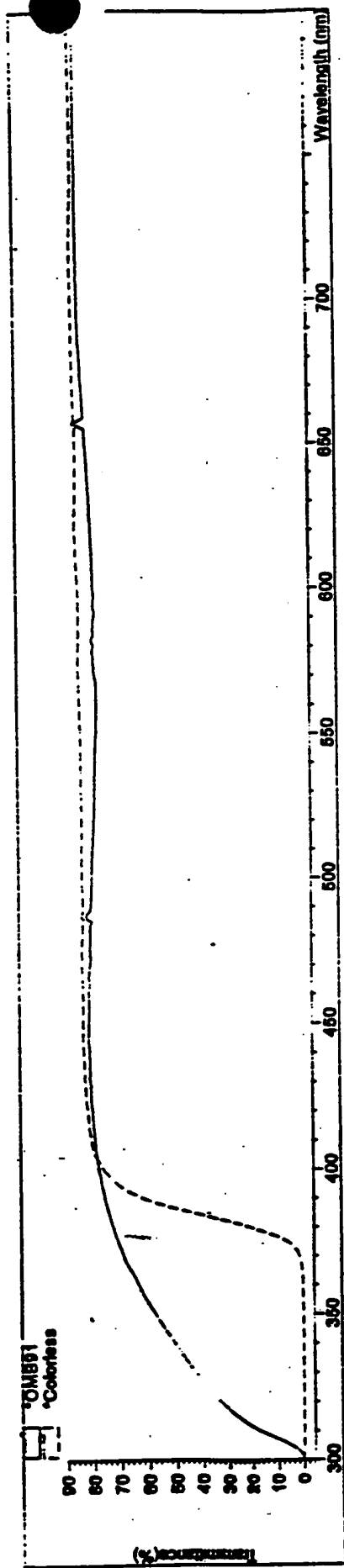


FIG. 31

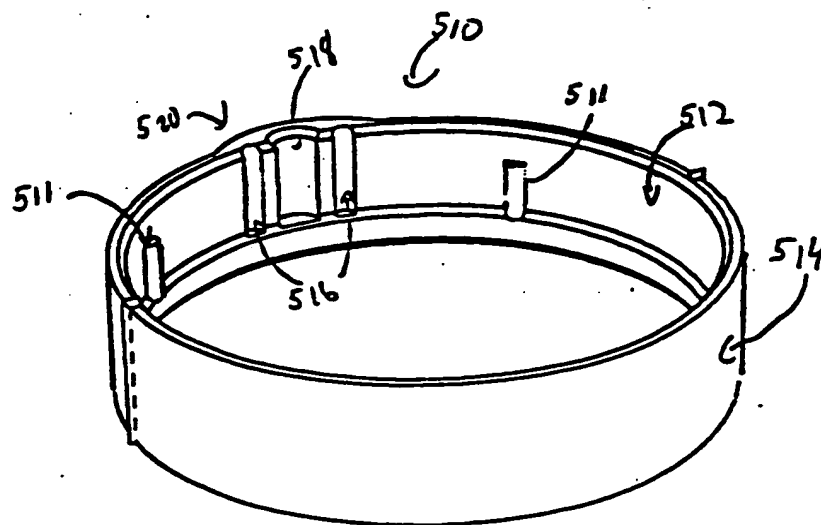


Fig. 32

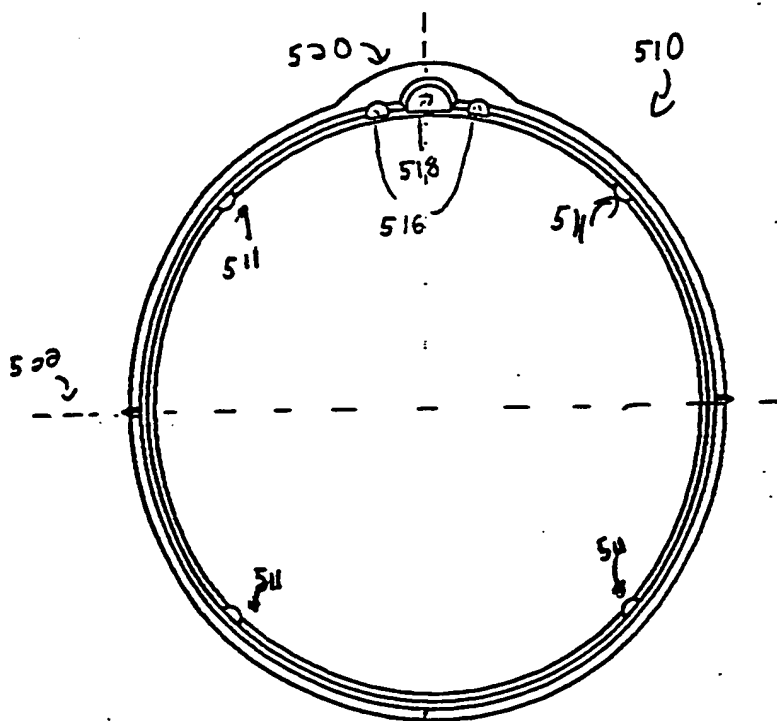


Fig. 33

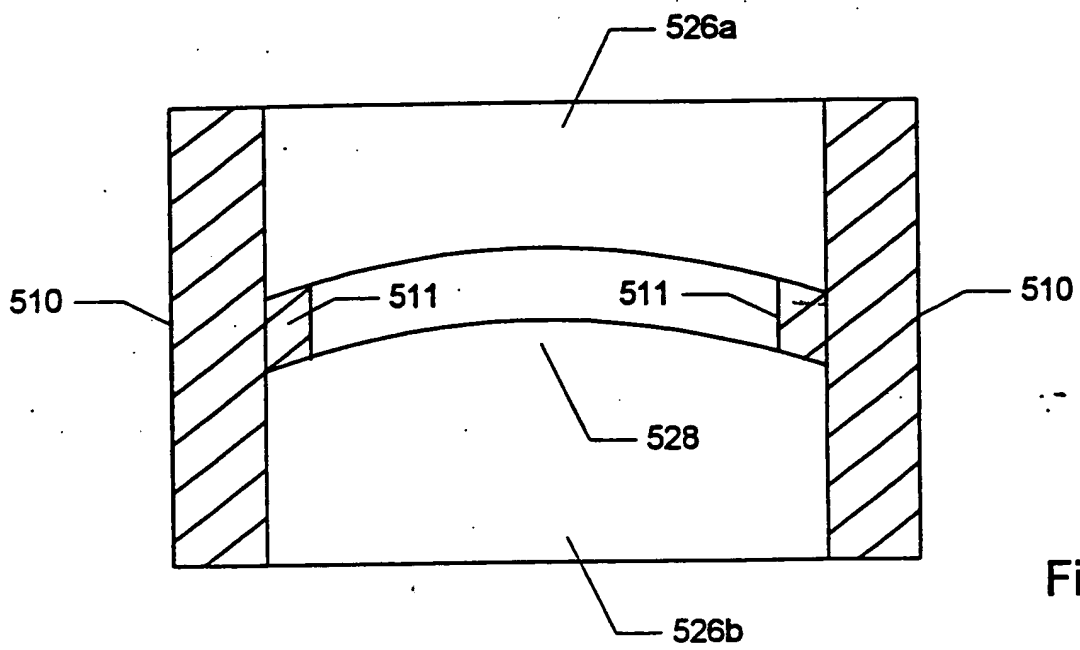


Fig. 34

FIG. 34 is a cross-sectional view of a device 500. The device 500 includes a substrate 510, a first layer 511, a second layer 526a, a third layer 526b, and a fourth layer 528. The first layer 511 is disposed on the substrate 510. The second layer 526a is disposed on the first layer 511. The third layer 526b is disposed on the second layer 526a. The fourth layer 528 is disposed on the third layer 526b. The first layer 511, the second layer 526a, the third layer 526b, and the fourth layer 528 are disposed between the two vertical hatched regions 510.

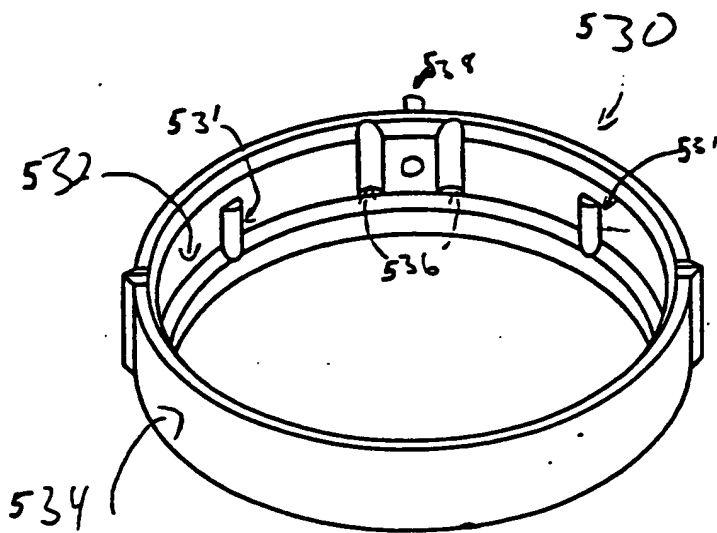


Fig. 35

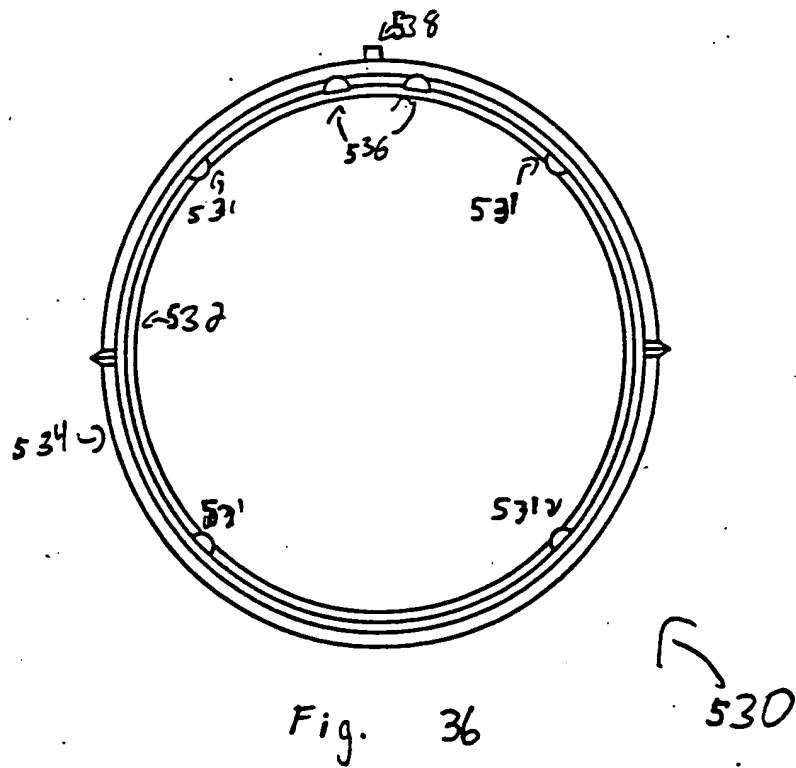


Fig. 36

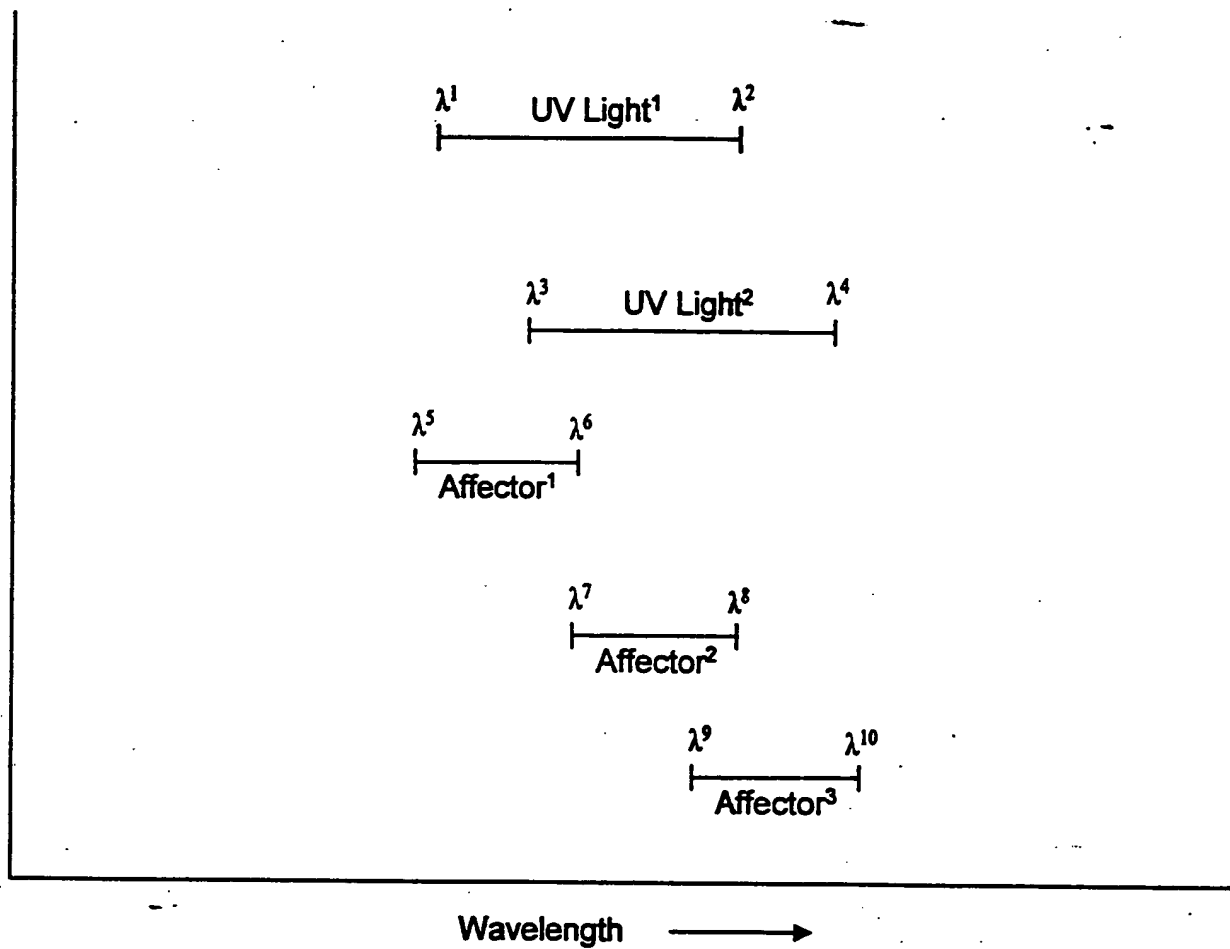
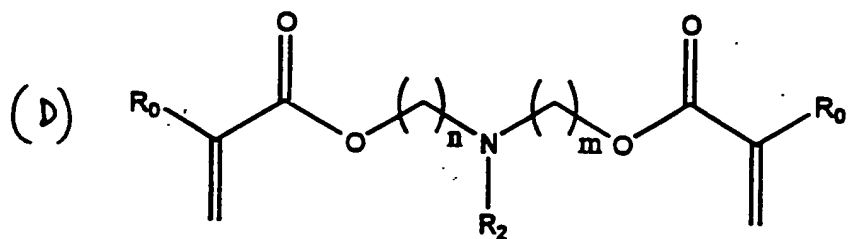
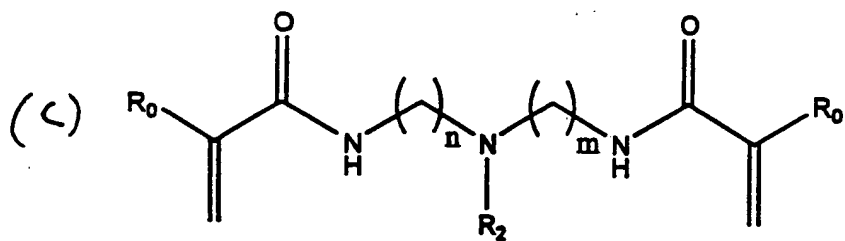
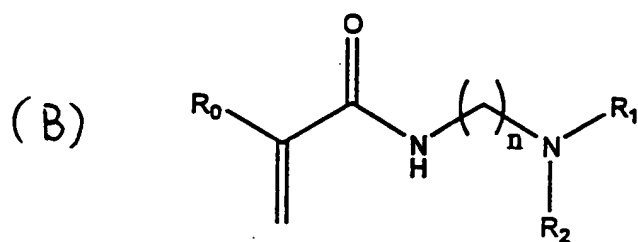
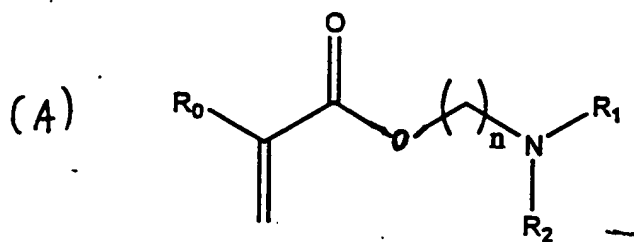


FIG. 37



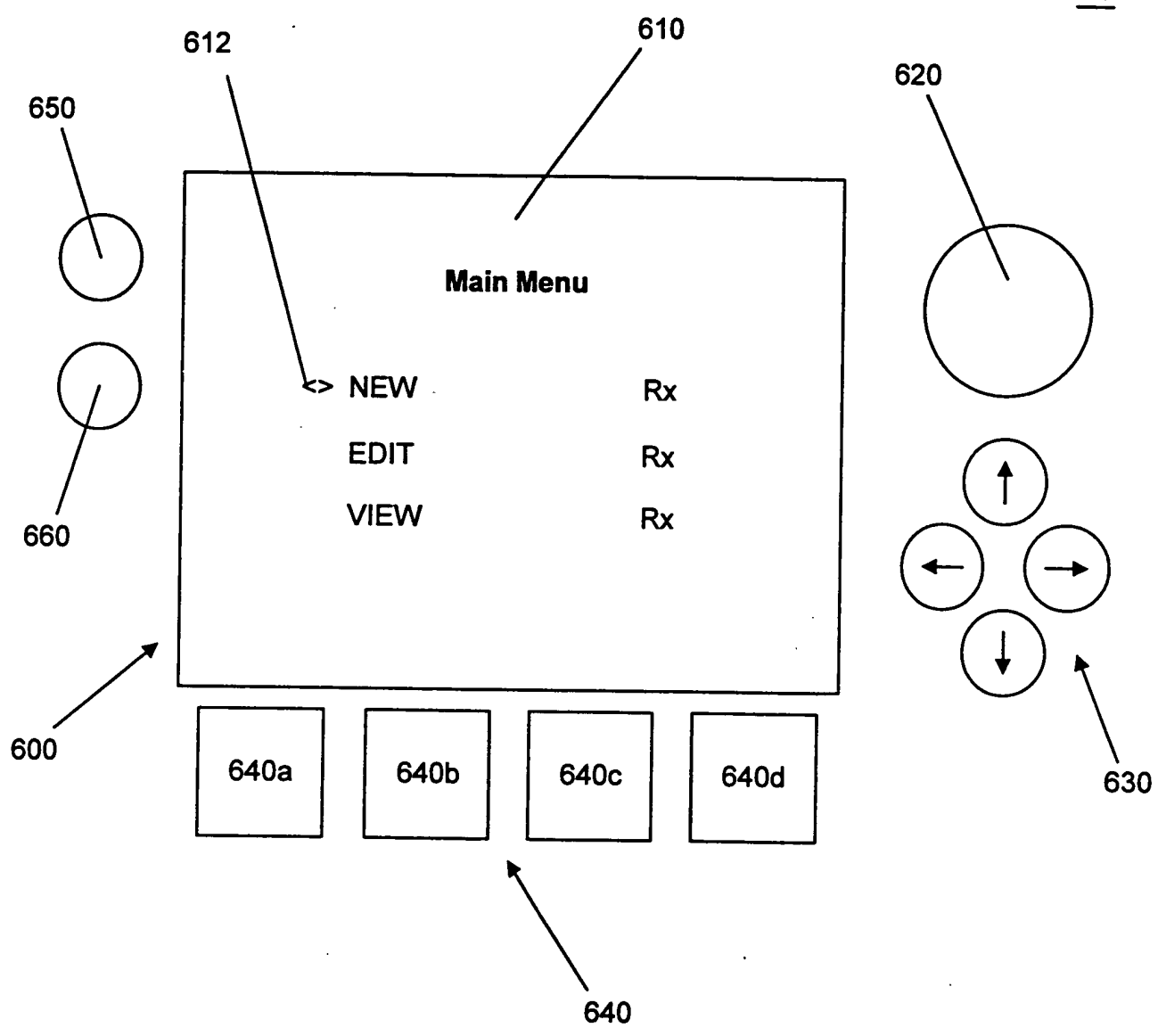


FIG. 40

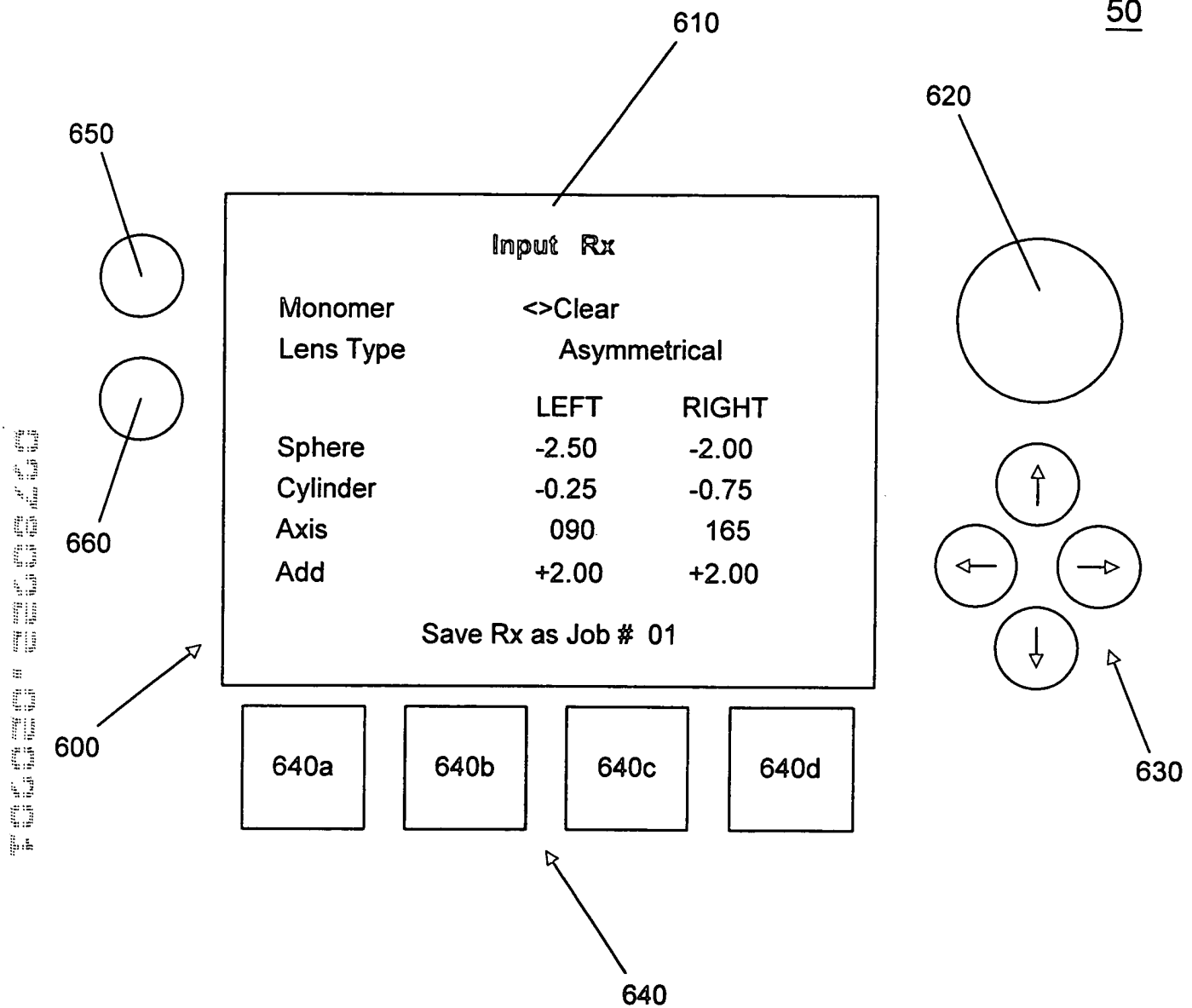


FIG. 41

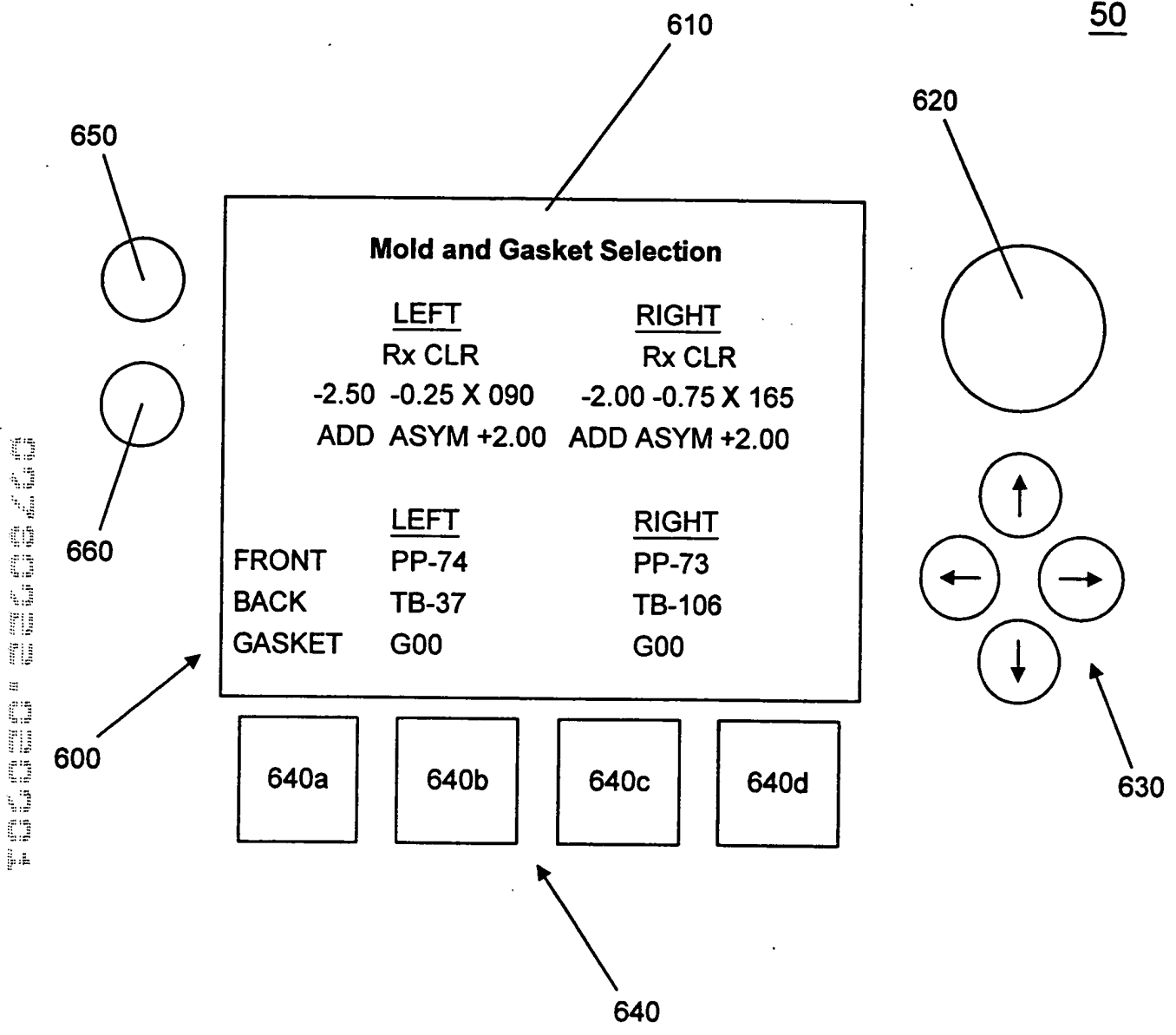


FIG. 42

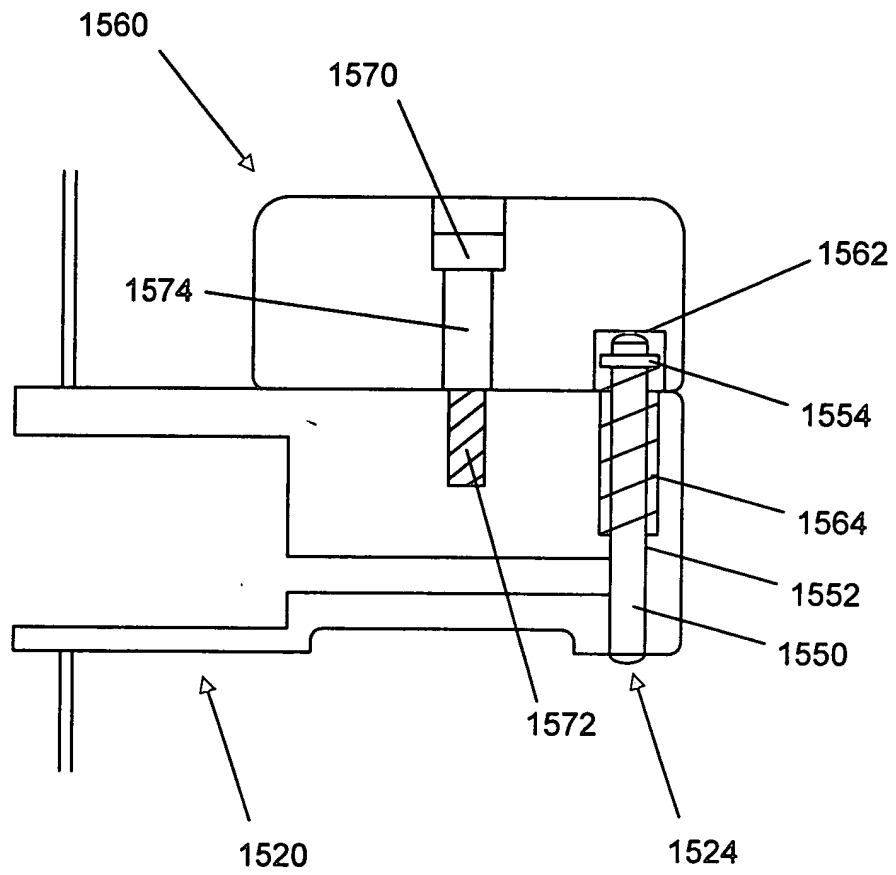


FIG. 44

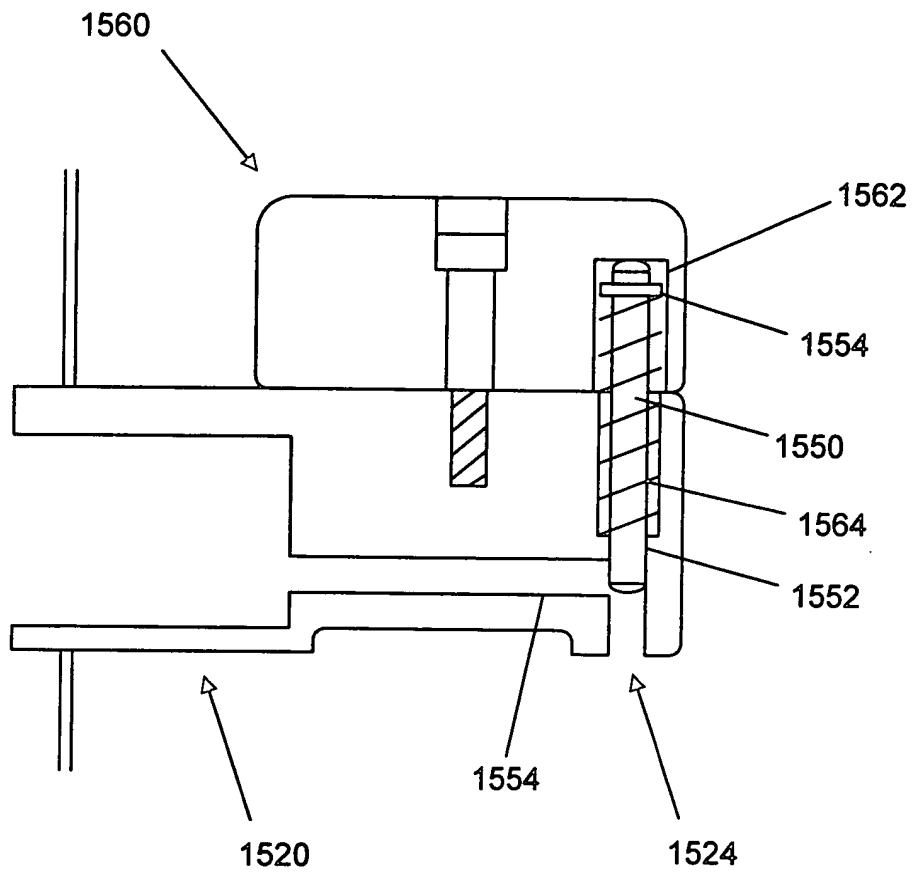


FIG. 45

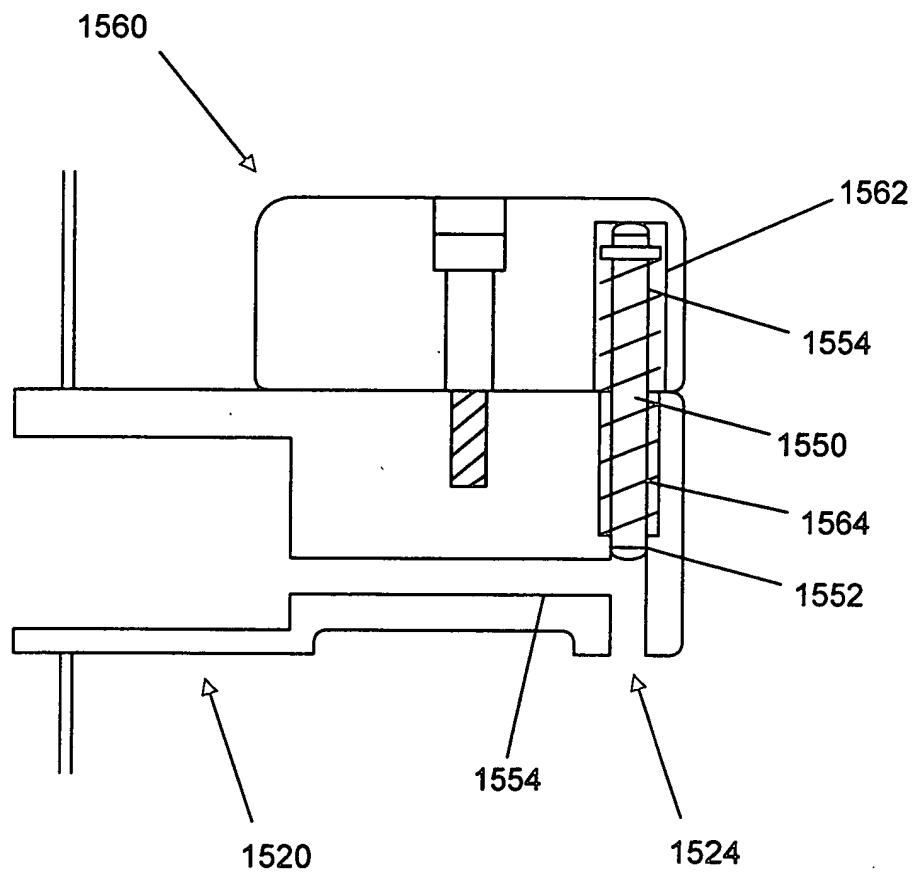


FIG. 46

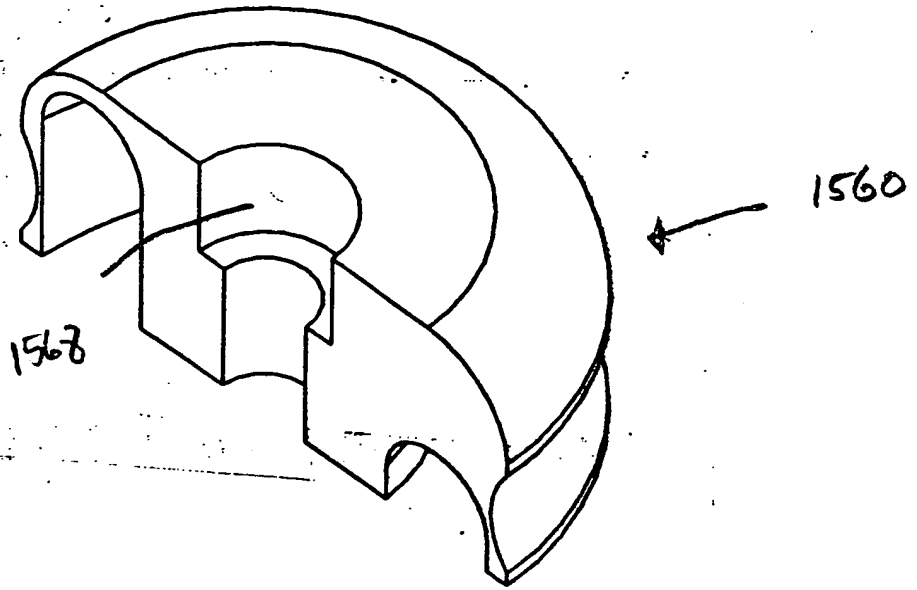


FIG. 47

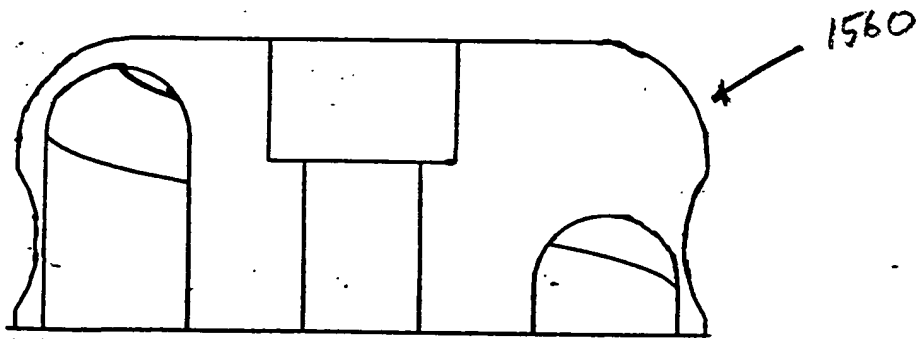


FIG. 48

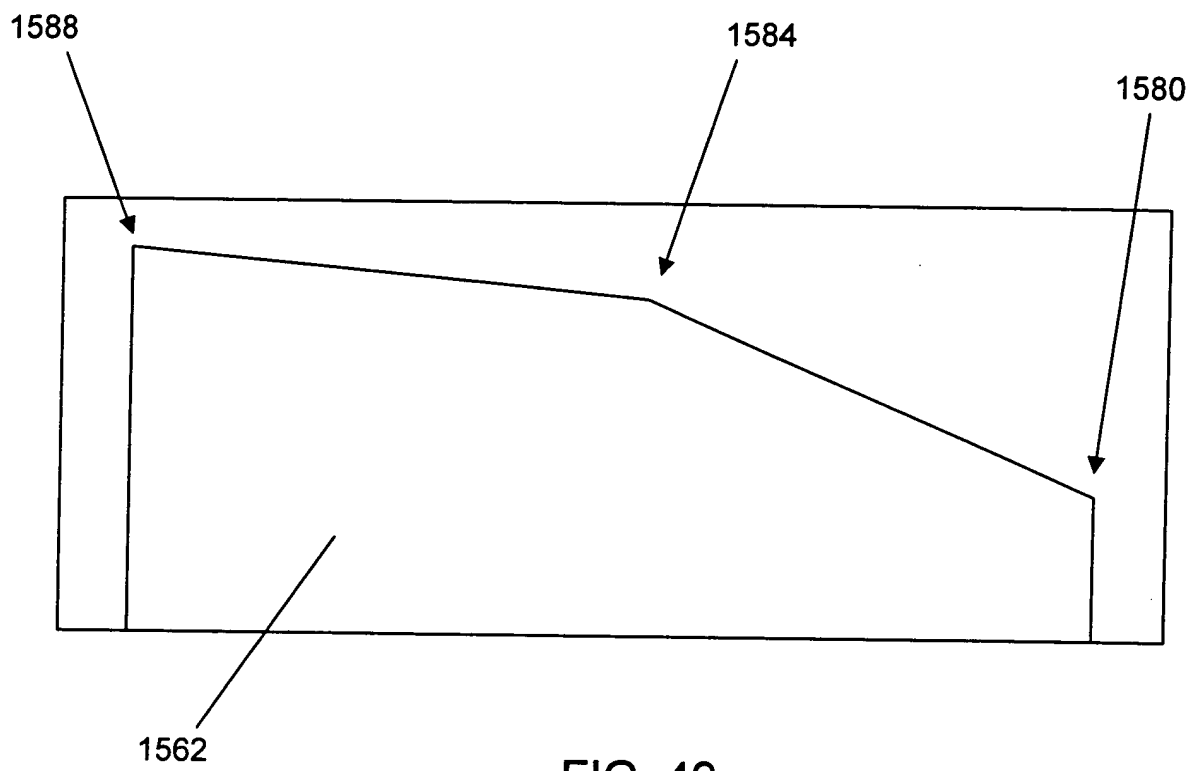


FIG. 49

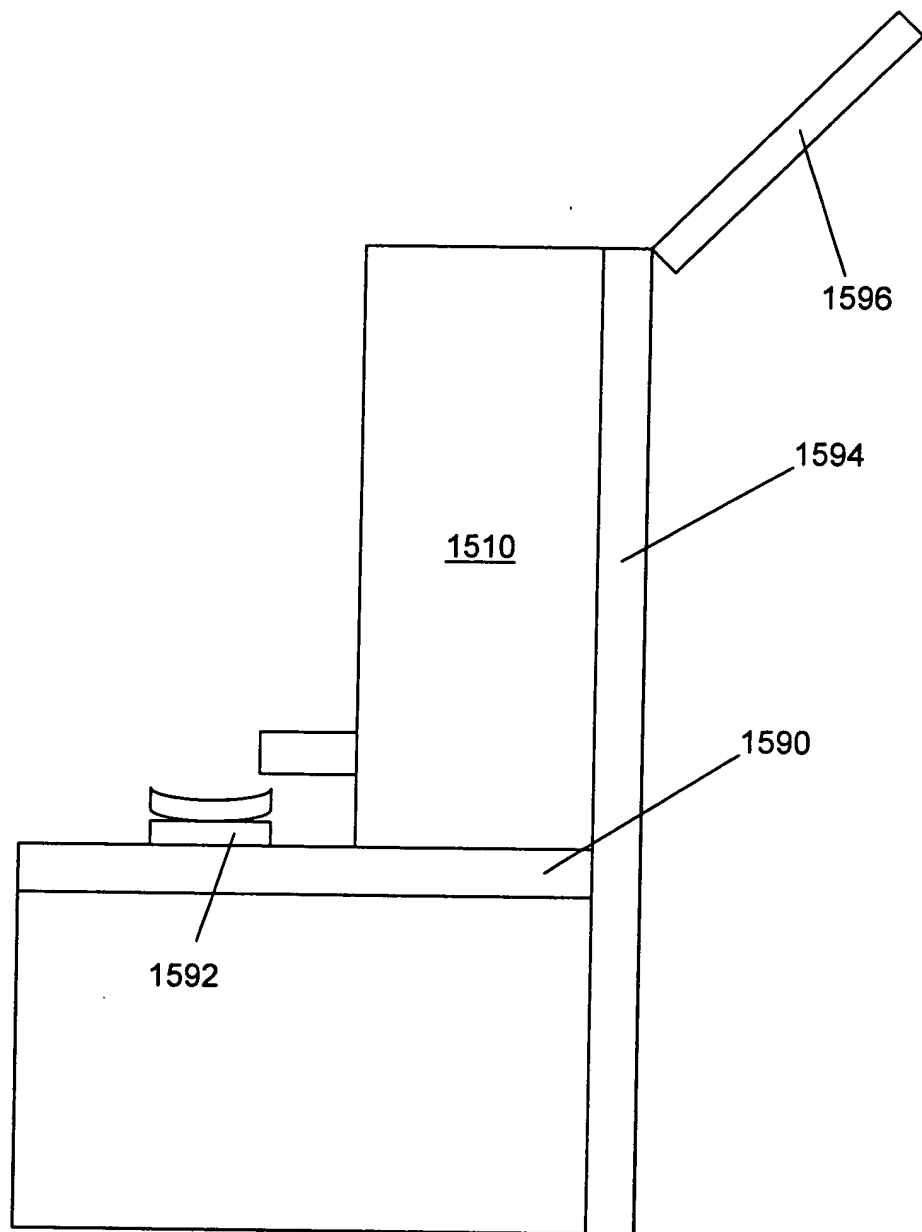


FIG. 50

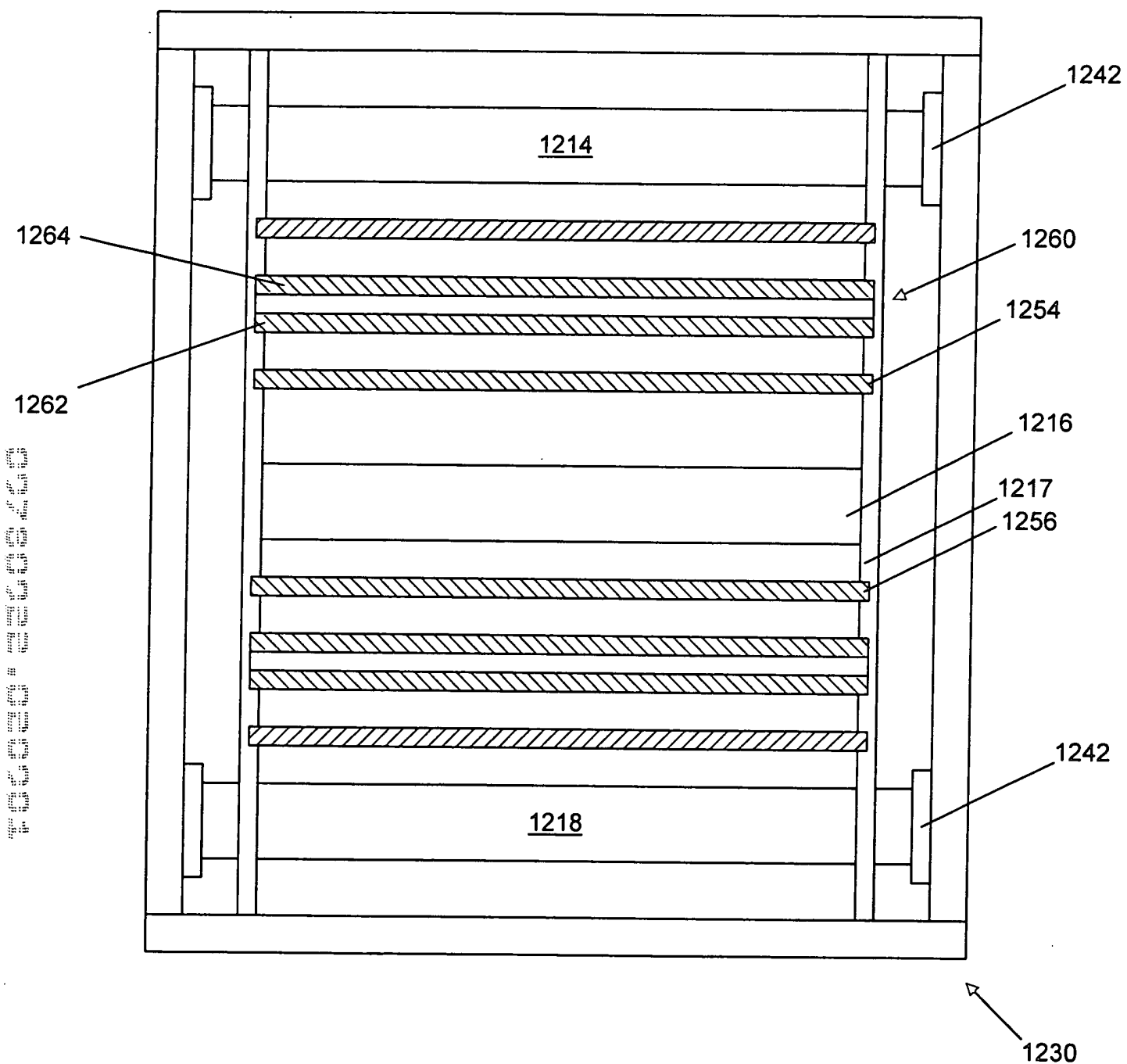


FIG. 51

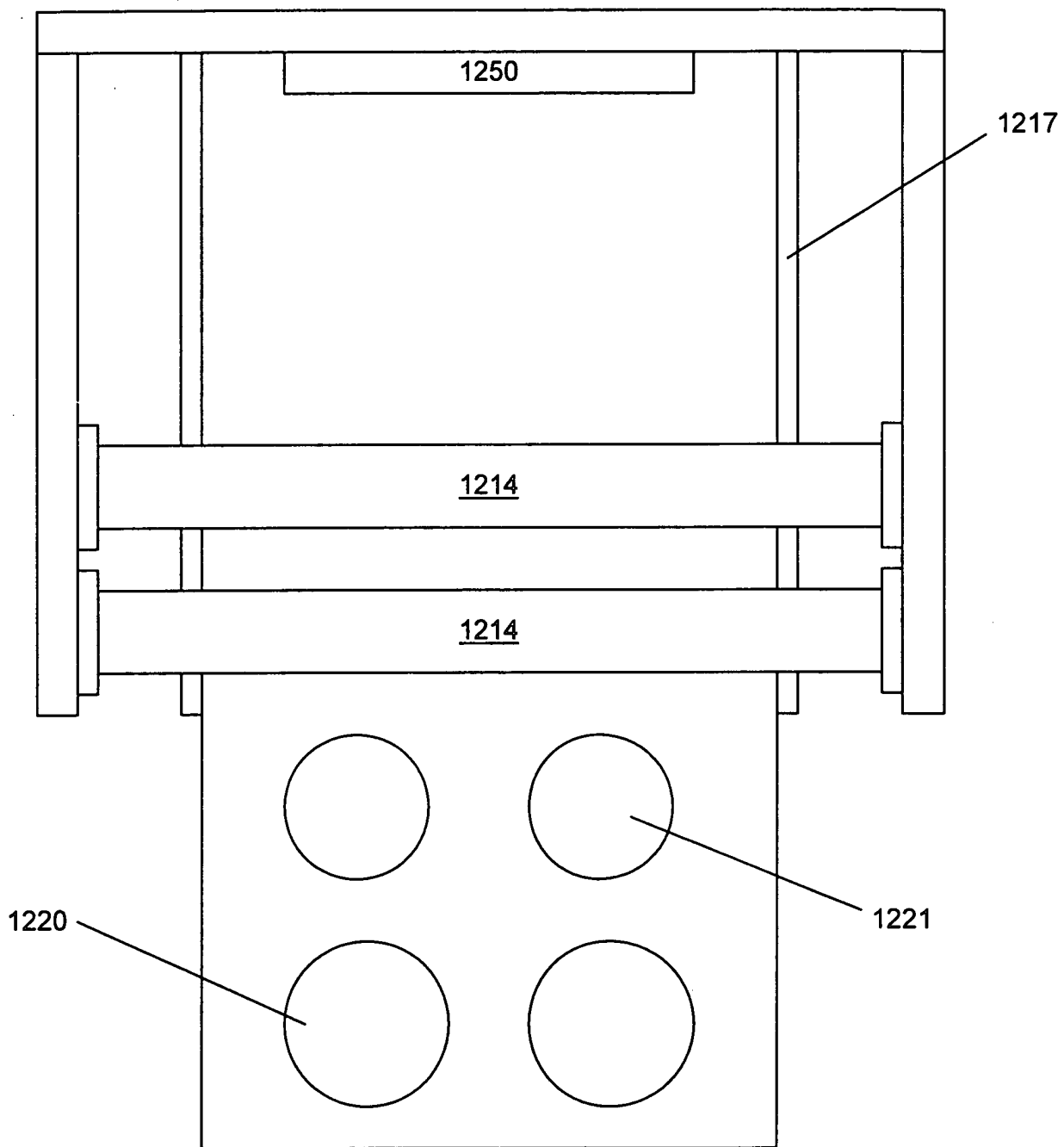


FIG. 52

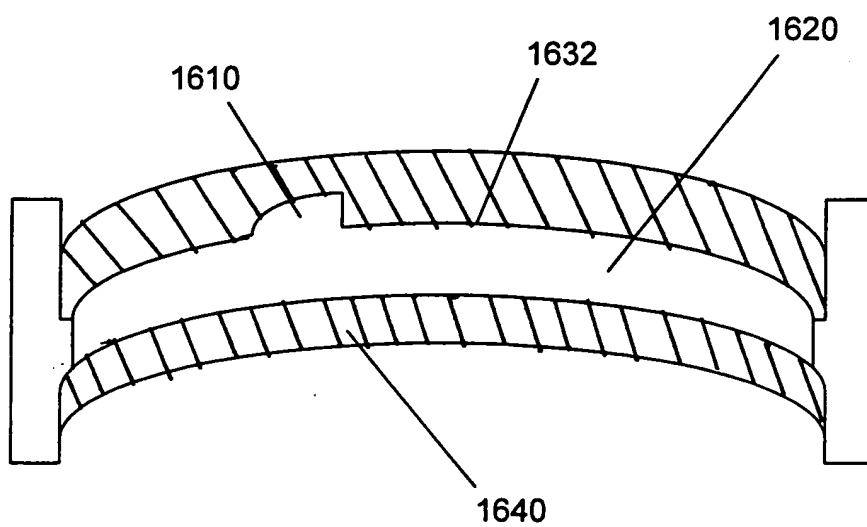


FIG. 53